



UNIVERSITY PROGRAM MANAGEMENT INFORMATION SYSTEM

FY 1989

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MANAGEMENT INFORMATION SYSTEM, FY 1989
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IMPORTANT NOTICE

This report is compiled primarily from information obtained from two internal NASA sources.

1. "CASE Report on Support of Colleges and Universities" (NASA Form 1356).
2. "Individual Procurement Action Report" (NASA Form 507).

Therefore, other sources should be used for completing Forms 507 or 1356.

NASA'S UNIVERSITY PROGRAM

ACTIVE PROJECTS

FISCAL YEAR 1989

**National Aeronautics and Space Administration
Office of External Relations
University Programs Branch / XEU
Washington, DC 20546**

FOREWORD

As basic policy NASA believes that colleges and universities should be encouraged to participate in the nation's space and aeronautics program to the maximum extent practicable. Indeed, universities are considered as partners with government and industry in the nation's aerospace program. NASA's objective is to have them bring their scientific, engineering, and social research competence to bear on aerospace problems and on the broader social, economic, and international implications of NASA's technical and scientific programs. It is expected that, in so doing, universities will strengthen both their research and their educational capabilities to contribute more effectively to the national well-being.

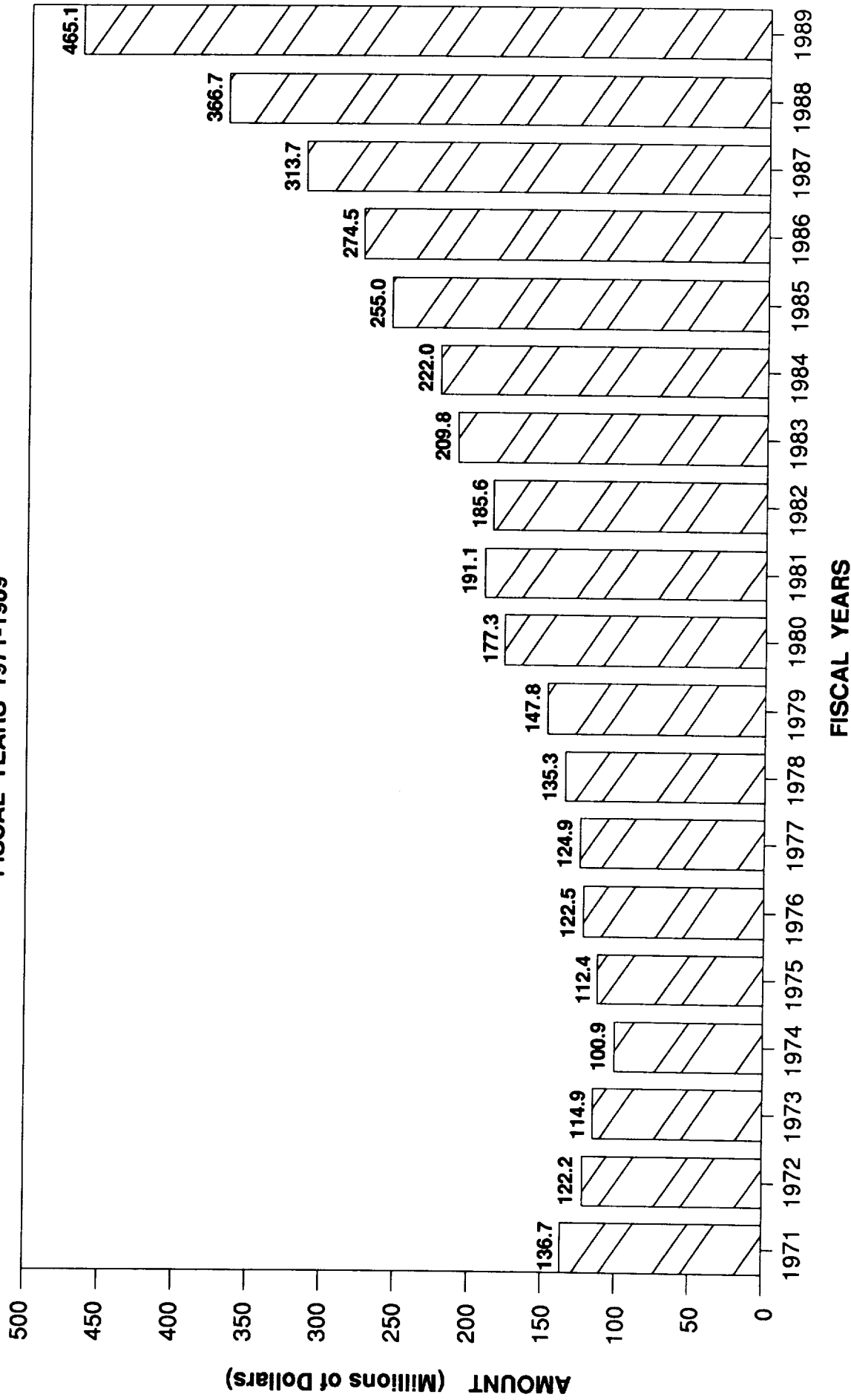
NASA Field Centers and certain Headquarters Program Offices provide funds for those R&D activities in universities which contribute to the mission needs of that particular NASA element. Although NASA has no predetermined amount of money to devote to university activities, the effort funded each year is substantial. (See the bar chart on the next page). This annual report is one means of documenting the NASA-university relationship, frequently denoted, collectively, as NASA's University Program.

This report is consistent with agency accounting records, as the data is obtained from NASA's Financial and Contractual Status (FACS) System, operated by the Financial Management Division and the Procurement Office. However, in accordance with interagency agreements, the orientation differs from that required for financial or procurement purposes. Any apparent discrepancies between this report and other NASA procurement or financial reports stem from the selection criteria for the data. For instance, as the report is designed to show the magnitude of obligations for a particular year, the fiscal year total is not reduced by subtraction of any deobligated prior year funds.

The report was prepared by the University Program Branch/XEU, Office of External Relations, NASA Headquarters.

NASA OBLIGATIONS TO UNIVERSITIES

FISCAL YEARS 1971-1989



NOTE: Excludes awards to California Institute of Technology for operation of the Jet Propulsion Laboratory.

FY 1971 includes \$15.0M in awards to Draper Lab.
 FY 1972 includes \$5.7M in awards to Draper Lab.

FY 1973 includes \$5.2M in awards to Draper Lab.
 In FY 1974 Draper Lab status changed from "university" to "nonprofit".

FIFTY EDUCATIONAL INSTITUTIONS LISTED ACCORDING TO TOTAL OBLIGATIONS FISCAL YEAR 1989

INSTITUTION		OBLIGATIONS (THOUSANDS)	PERCENT
		\$465,102	100.00
1	Stanford University	41,807	8.99
2	University of California at Berkeley	24,574	5.28
3	Massachusetts Institute of Technology	19,486	4.19
4	New Mexico State University at Las Cruces	19,433	4.18
5	University of Arizona	16,147	3.47
6	University of Colorado at Boulder	13,307	2.86
7	University of Maryland at College Park	12,962	2.79
8	University of Iowa	12,429	2.67
9	University of California at San Diego	12,067	2.59
10	University of Michigan at Ann Arbor	12,042	2.59
11	University of Alabama at Huntsville	11,720	2.52
12	University of Wisconsin at Madison	9,452	2.03
13	Pennsylvania State University at University Park	8,167	1.76
14	California Institute of Technology *	7,703	1.66
15	Case Western Reserve University	6,745	1.45
16	University of Texas at Austin	6,632	1.43
17	University of Chicago	6,241	1.34
18	University of California at Los Angeles	6,155	1.32
19	University of Hawaii	6,094	1.31
20	Old Dominion University	5,628	1.21
21	Ohio State University	5,395	1.16
22	Cornell University	5,326	1.15
23	University of Southern California	5,291	1.14
24	University of Houston at Clear Lake	5,194	1.12
25	University of New Hampshire	4,896	1.05
26	Johns Hopkins University	4,489	0.97
27	Harvard University	4,473	0.96
28	Texas A & M University	4,156	0.89
29	Virginia Polytechnic Institute	4,086	0.88
30	University of Washington	4,049	0.87
31	Columbia University	3,943	0.85
32	San Jose State University	3,866	0.83
33	Carnegie Mellon University	3,698	0.80
34	North Carolina State University	3,647	0.78
35	University of Illinois at Urbana	3,627	0.78
36	Princeton University	3,586	0.77
37	Oklahoma State University	3,473	0.75
38	Georgia Institute of Technology	3,465	0.74
39	University of Alaska at Fairbanks	3,384	0.73
40	University of Virginia	3,314	0.71
41	University of Houston	3,250	0.70
42	Purdue University	3,231	0.69
43	George Washington University	2,930	0.63
44	Washington University at St. Louis	2,880	0.62
45	Cleveland State University	2,861	0.62
46	Rensselaer Polytechnic Institute of New York	2,696	0.58
47	University of Minnesota at St. Paul	2,672	0.57
48	Vanderbilt University	2,670	0.57
49	University of Alabama at Birmingham	2,659	0.57
50	Auburn University at Auburn	2,181	0.47
Other Colleges and Universities **		94,923	20.41

* Excludes awards to California Institute of Technology for operation of the Jet Propulsion Laboratory.

** Includes both foreign and domestic universities and colleges.

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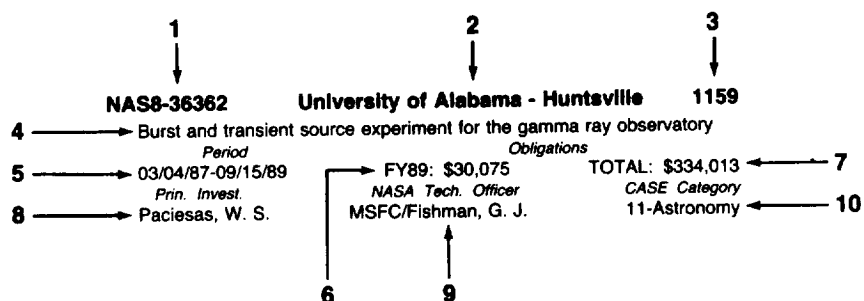
This report includes data on projects active during Fiscal Year 1989.

Alabama	1	Montana	203
Alaska	13	Nebraska	204
Arizona	15	Nevada	205
Arkansas	31	New Hampshire	205
California	32	New Jersey	208
Colorado	86	New Mexico	213
Connecticut	100	New York	216
Delaware	101	North Carolina	236
District of Columbia	102	North Dakota	242
Florida	107	Ohio	242
Georgia	115	Oklahoma	263
Hawaii	121	Oregon	264
Idaho	125	Pennsylvania	266
Illinois	125	Rhode Island	278
Indiana	137	South Carolina	280
Iowa	142	South Dakota	282
Kansas	148	Tennessee	282
Kentucky	150	Texas	286
Louisiana	151	Utah	309
Maine	153	Vermont	312
Maryland	154	Virginia	312
Massachusetts	166	Washington	330
Michigan	186	West Virginia	336
Minnesota	195	Wisconsin	337
Mississippi	198	Wyoming	343
Missouri	199	Foreign Countries	344
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USER'S GUIDE

The University Program Report provides current information and related statistics for each grant/contract/cooperative agreement active during the report period. The following guidance is provided as an aid to the reader in readily locating material of interest and in optimizing the use of this document.

I. Typical Citation



Key

1. Agreement Number*
2. Institution Name
3. Accession Number
4. Brief work description
5. Approximate period of performance
6. Amount (if any) actually provided during the indicated fiscal year
7. Total amount actually provided during the indicated period of performance
8. Principal Investigator(s) at the educational institution
9. NASA Technical Officer(s) and organizational location
10. CASE Field of Science and Engineering code and name

* Uniquely identifies project. Prefixes denote type of instrument as follows:

Grants
 Cooperative Agreements
 Contracts
 Space Act Agreements
 NAG, NAGW, NGF, NGT, NGL, NGR, NSG
 NCC, NCCW
 DEN, NAS, NASR, NASW, NSR
 NCA

II. NASA Installations

NASA installations are included in the citation as abbreviations (item 9). The following listing of installations will be useful to those desiring further information on specific projects.

Abbrev.	Installation Name and Address	Telephone Number for Information
ARC	Ames Research Center NASA Moffett Field, CA 94035	(415)604-5000
DFRC	Dryden Flight Research Facility NASA P.O. Box 273 Edwards, CA 93523	(805)258-3311
GSFC	Goddard Space Flight Center NASA Greenbelt, MD 20771	(301)286-2000
JSC	Johnson Space Center NASA Houston, TX 77058	(713)483-3111
KSC	Kennedy Space Center NASA Kennedy Space Center, FL 32899	(305)867-7110
LARC	Langley Research Center NASA Hampton, VA 23665	(804)865-2691
LERC	Lewis Research Center NASA 2100 Brookpark Road Cleveland, OH 44135	(216)433-4000
MSFC	Marshall Space Flight Center NASA Marshall Space Flight Center, AL 35812	(205)544-2121
NSTL	National Space Technology Laboratories NASA NSTL Station, MS 39529	(601)688-2211
HQ	NASA Headquarters Washington, DC 20546	(202)453-1000

The abbreviation for NASA Headquarters, HQ, usually carries a suffix, for example HQ-EB, which denotes a particular office code and general area of responsibility. A full listing of the suffix letters and information on NASA's organizational structure may be found in the NASA Headquarters Telephone Directory. (The Directory is for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

III. CASE Fields of Science and Engineering

The National Science Foundation (NSF) operates a government-wide system (CASE) for collecting and analyzing data on support to colleges and universities. Participating agencies report annually to NSF which in turn issues *Support to Universities, Colleges and Selected Nonprofit Institutions*. The CASE fields, used in the extensive tabulations contained in that document, form the only consistent classification system for government sponsored research. The fields are listed in full in the Appendix.

IV. Cross-Index

The cross-indexed Appendix provides rapid access to all projects in a particular area of endeavor, as defined by the CASE fields. This listing is also easily used to determine the institutions and principal investigators conducting NASA projects in a field. Entries are related to the citations (descriptions) by the accession number (item 3). The accession number has meaning only in this report; it is in no way permanently associated with nor does it uniquely identify a specific grant/contract/cooperative agreement anywhere except in the present report. Accession numbers are assigned sequentially to the citations, beginning with 1000. Thus, when an entry of interest is identified in the Appendix, the associated accession number allows ready location of the full description in the body of the report.

NASA'S UNIVERSITY PROGRAM

ALABAMA

NAG 8-23 Alabama A&M University 1000
 Research and training in intelligent robotic systems
Period Obligations
 02/09/84-09/30/89 FY89: TOTAL: \$656,343
Prin. Invest. NASA Tech. Officer CASE Category
 Hurlford, G. J. MSFC/Randall, J. L. 46-Mech Engr
 Prince, T. A. MSFC/Walker, R. J.
 Borelli, M.

NAG 8-24 Alabama A&M University 1001
 Advanced interactive analytical integration and mission planning database for the space station
Period Obligations
 02/09/84-07/12/90 FY89: TOTAL: \$197,995
Prin. Invest. NASA Tech. Officer CASE Category
 Saha, H. MSFC/Randall, J. L. 22-Computer Science
 MSFC/Walker, R. J.

NAG 8-27 Alabama A&M University 1002
 High energy cosmic ray interactions in emulsion
Period Obligations
 08/22/84-12/30/89 FY89: TOTAL: \$186,158
Prin. Invest. NASA Tech. Officer CASE Category
 McGuire, S. C. MSFC/Randall, J. L. 13-Physics
 MSFC/Walker, R. L.

NAG 8-29 Alabama A&M University 1003
 Surface roughness of flat and curved optical surfaces
Period Obligations
 06/01/85-11/30/89 FY89: TOTAL: \$612,735
Prin. Invest. NASA Tech. Officer CASE Category
 Venkateswarly, P. MSFC/Randall, J. L. 46-Mech Engr
 MSFC/Walker, R. J.

NAG 8-36 Alabama A&M University 1004
 Research on coded mask telescope
Period Obligations
 09/18/85-12/18/90 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
 George, M. C. MSFC/Darbro, W. 11-Astronomy
 MSFC/Walker, R. J.

NAG 8-42 Alabama A&M University 1005
 SSME data prediction statistical study
Period Obligations
 09/26/85-09/25/87 FY89: TOTAL: \$71,516
Prin. Invest. NASA Tech. Officer CASE Category
 Shipman, J. R. MSFC/Randall, J. L. 41-Aero Engr
 Temple, E. C. MSFC/Blount, D.

NAG 8-45 Alabama A&M University 1006
 Ellipsometric measurement of liquid
Period Obligations
 09/26/85-12/24/89 FY89: TOTAL: \$41,496
Prin. Invest. NASA Tech. Officer CASE Category
 Chong, K. MSFC/Randall, J. L. 13-Physics
 MSFC/Walker, R. J.

NAG 8-64 Alabama A&M University 1007
 Low thrust viscous nozzle flow fields prediction
Period Obligations
 04/28/86-02/09/90 FY89: \$98,801 TOTAL: \$209,157
Prin. Invest. NASA Tech. Officer CASE Category
 Liaw, G. MSFC/Randall, J. L. 13-Physics
 MSFC/Walker, R. J.

NAG 8-76 Alabama A&M University 1008
 Microstructural characteristics of Ni based superalloys at high temperature
Period Obligations
 10/01/86-02/29/90 FY89: TOTAL: \$202,861
Prin. Invest. NASA Tech. Officer CASE Category
 Lal, R. B. MSFC/Randall, J. L. 13-Physics
 Aggarwal, M. D. MSFC/Walker, R. J.

NAG 8-90 Alabama A&M University 1009
 Determination of trace elements in triglycine sulfate solutions
Period Obligations
 05/01/87-06/30/89 FY89: TOTAL: \$98,192
Prin. Invest. NASA Tech. Officer CASE Category
 Tadros, S. H. MSFC/Randall, J. L. 43-Chem Engr
 MSFC/Walker, R. J.

NAG 8-97 Alabama A&M University 1010
 Mechanism of chromosomal agerration production in repair deficient human cells
Period Obligations
 01/28/88-07/28/89 FY89: TOTAL: \$107,000
Prin. Invest. NASA Tech. Officer CASE Category
 Kale, R. MSFC/Randall, J. L. 59-Life Sci, NEC
 MSFC/Walker, R. J.

NAG 8-107 Alabama A&M University 1011
 Nonlinear properties of organic materials in lead-tin fluorophosphate glasses and thin films/ polymer composites
Period Obligations
 08/22/88-12/22/89 FY89: \$9,900 TOTAL: \$349,125
Prin. Invest. NASA Tech. Officer CASE Category
 George, M. C. MSFC/Randall, J. L. 13-Physics
 MSFC/Walker, R. J.

NAG 8-115 Alabama A&M University 1012
 Rutherford scattering spectroscopy and nuclear reaction analysis
Period Obligations
 12/09/88-12/08/89 FY89: \$415,652 TOTAL: \$415,652
Prin. Invest. NASA Tech. Officer CASE Category
 Ila, D. MSFC/Randall, J. L. 51-Biological Sci
 Holland, L.

NAG 8-125 Alabama A&M University 1013
 Growth characteristics of organic crystals for nonlinear optical applications
Period Obligations
 04/24/89-04/23/92 FY89: \$108,458 TOTAL: \$108,458
Prin. Invest. NASA Tech. Officer CASE Category
 Aggarwal, M. D. MSFC/Randall, J. L. 13-Physics
 MSFC/Walker, R. J.

NAG 8-127 Alabama A&M University 1014
 Adsorbate islanding and temperature programmed desorption by a combined quantum Monte Carlo and lattice gas approach
Period Obligations
 04/05/89-04/05/90 FY89: \$69,327 TOTAL: \$69,327
Prin. Invest. NASA Tech. Officer CASE Category
 Ila, D. MSFC/Randall, J. L. 41-Aero Engr

NASA'S UNIVERSITY PROGRAM
ALABAMA (Continued)

NAG 9-246			Alabama A&M University	1015
Genetic effects of heavy ions in drosophila				
<i>Period</i>		<i>Obligations</i>		
07/01/87-03/01/90	FY89: \$115,265	TOTAL: \$240,265		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
Kale, P.	JSC/Nachtwey, D. S.	51-Biological Sci		
NAGW 1067			Alabama A&M University	1016
Model of Jovian F region ionosphere				
<i>Period</i>		<i>Obligations</i>		
02/01/87-08/04/89	FY89:	TOTAL: \$14,938		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
Tan, A.	HQ-EL/Fox, K.	31-Atmos Sci		
	HQ-EL/Quaide, W. L.			
NAGW 1459			Alabama A&M University	1017
A forum on NASA sponsored research at historically black colleges and universities				
<i>Period</i>		<i>Obligations</i>		
07/01/88-09/30/89	FY89: \$135,257	TOTAL: \$135,257		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
George, M. C.	HQ-U/Freeman, Y. B.	99-Multi-Discip		
Saunders, Y.				
NAS 8-36277			Alabama A&M University	1018
Elementary and middle school science improvement project				
<i>Period</i>		<i>Obligations</i>		
04/28/86-10/01/88	FY89:	TOTAL: \$60,788		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
McGuire, S. Y.	MSFC/Foster, C.	19-Phys Sci, NEC		
	MSFC/Walker, R. W.			
NAS 8-36299			Alabama A&M University	1019
Nozzle material investigation				
<i>Period</i>		<i>Obligations</i>		
03/04/85-07/31/89	FY89:	TOTAL: \$252,844		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
Thompson, J. H.	MSFC/Austin, J. G., Jr.	12-Chemistry		
	MSFC/Congo, R.			
NAS 8-36634			Alabama A&M University	1020
Solution crystal growth in low gravity				
<i>Period</i>		<i>Obligations</i>		
09/25/86-10/31/89	FY89: \$95,000	TOTAL: \$545,000		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
Lal, R. B.	MSFC/Ruff, R. C.	51-Biological Sci		
NCC 2-501			Alabama A&M University	1021
Characterization of spirulina biomass for CELSS diet potential				
<i>Period</i>		<i>Obligations</i>		
11/01/87-04/30/90	FY89: \$90,160	TOTAL: \$178,390		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
Tadros, M.	ARC/MacElroy, R. D.	51-Biological Sci		
NCC 2-607			Alabama A&M University	1022
Demonstrate production of salad crops in the space station mockup facility with particular attention to space energy				
<i>Period</i>		<i>Obligations</i>		
07/01/89-06/30/90	FY89: \$91,500	TOTAL: \$91,500		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
Brooks, C.	ARC/MacElroy, R. D.	54-Env Biology		
Shama, G. C.				
Logan, J. F.				
NGT 00-050-358			Alabama A&M University	1023
NASA graduate student researchers program				
<i>Period</i>		<i>Obligations</i>		
09/01/88-08/31/90	FY89:	TOTAL: \$17,864		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
Lal, R. B.	HQ-XE/Owens, F. C.	13-Physics		
NSG 8037			Alabama A&M University	1024
Atmospheric effects on coherent laser systems				
<i>Period</i>		<i>Obligations</i>		
06/01/76-10/01/89	FY89:	TOTAL: \$421,489		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
Murty, S. S.	MSFC/Randall, J. L.	45-Elec Engr		
	MSFC/Walker, R. J.			
NAG 3-1055			Auburn University	1025
A system analysis of energy management for lunar facilities				
<i>Period</i>		<i>Obligations</i>		
06/01/89-05/31/90	FY89: \$57,401	TOTAL: \$57,401		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
Gordon, L. B.	LERC/Cataldo, R. L.	45-Elec Engr		
Rose, M. F.				
NAG 8-119			Auburn University	1026
A method for the early detection of instabilities in rotor dynamics				
<i>Period</i>		<i>Obligations</i>		
12/27/88-12/26/89	FY89: \$64,826	TOTAL: \$64,826		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
Zalik, R. A.	MSFC/Fox, T. H.	46-Mech Engr		
	MSFC/Coffey, S.			
NAG 8-618			Auburn University	1027
A preliminary design for a get away tethered experiment				
<i>Period</i>		<i>Obligations</i>		
02/02/87-02/01/90	FY89: \$50,000	TOTAL: \$179,758		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
Green, M. E.	MSFC/Rupp, C. C.	49-Engr, NEC		
NAG 8-636			Auburn University	1028
The design of optical sensors for the pinhole occulter facility				
<i>Period</i>		<i>Obligations</i>		
06/01/87-05/31/90	FY89: \$40,005	TOTAL: \$90,005		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
Greene, M. E.	MSFC/Dabbs, J. R.	42-Astro Engr		
NAG 8-647			Auburn University	1029
Damping phenomena in wire rope isolators				
<i>Period</i>		<i>Obligations</i>		
06/15/87-12/15/88	FY89:	TOTAL: \$97,541		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
Cochran, J. E.	MSFC/Guest, S. H.	41-Aero Engr		
Cutchins, M. A.				
NAG 8-683			Auburn University	1030
A new generation solid rocket motor ignition				
<i>Period</i>		<i>Obligations</i>		
11/13/87-11/12/90	FY89: \$99,890	TOTAL: \$199,780		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
Foster, W. A.	MSFC/Hengel, J. E.	49-Engr, NEC		
Jenkins, R. M.	MSFC/Martin, C. L.			

NASA'S UNIVERSITY PROGRAM
ALABAMA (Continued)

NAG 8-719	Auburn University	1031	Hypervelocity impact at velocities above km's
<i>Period</i>	<i>Obligations</i>		
06/01/88-06/01/91	FY89: \$72,800	TOTAL: \$164,100	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Askew, R. F.	MSFC/Taylor, R. A.	47-Materials Engr	
Rose, M. F.	MSFC/Smith, H. E.		
NAG 9-330	Auburn University	1032	Chemical distribution during petrogenesis of anorthosite and related rocks
<i>Period</i>	<i>Obligations</i>		
06/01/89-06/01/90	FY89: \$30,000	TOTAL: \$30,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Salpas, P. A.	JSC/Browne, I. D.	12-Chemistry	
NAGW 758	Auburn University	1033	Spatial and temporal variability of soil temperature, moisture and surface soil properties as they relate to science issues of global habitability
<i>Period</i>	<i>Obligations</i>		
08/01/85-12/31/88	FY89:	TOTAL: \$208,790	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hajek, B. F.	HQ-EE/Arnold, R.	39-Env Sci, NEC	
Dane, J. H.			
NAGW 1192	Auburn University	1034	Center for the commercial development of space
<i>Period</i>	<i>Obligations</i>		
10/01/87-10/31/89	FY89: \$1,040,000	TOTAL: \$2,123,450	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Askew, R.	HQ-IC/Oran, W. A.	42-Astro Engr	
	HQ/Whitten, R. P.		
NAG13-7	Auburn University	1035	Chemical anatomical and water stress influences on the spectral reflectance of different leaf types
<i>Period</i>	<i>Obligations</i>		
05/19/88-03/18/89	FY89:	TOTAL: \$15,365	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Mitchell, R. J.	SSC/Carter, G. A.	55-Agriculture Sci	
NAS 5-30566	Auburn University	1036	Grid on a balloon
<i>Period</i>	<i>Obligations</i>		
06/27/89-12/15/89	FY89: \$43,755	TOTAL: \$43,755	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Greene, M.	GSFC/Jo Crannell, C.	45-Elec Engr	
NAS 8-35057	Auburn University	1037	A theoretical investigation of solar plasma phenomena
<i>Period</i>	<i>Obligations</i>		
04/01/83-07/31/88	FY89:	TOTAL: \$26,778	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hinata, S.	MSFC/Moore, R. L.	31-Atmos Sci	
	MSFC/Fields, S. A.		
NAS 8-36146	Auburn University	1038	Measurement of damping of graphite epoxy material
<i>Period</i>	<i>Obligations</i>		
08/06/84-06/30/89	FY89:	TOTAL: \$248,337	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Crocker, M. J.	MSFC/Guest, S. H.	46-Mech Engr	
	MSFC/Reed, D. K.		
NAS 8-36288	Auburn University	1039	Stress analysis of the space telescope focal plane structure joint
<i>Period</i>	<i>Obligations</i>		
09/13/84-05/31/89	FY89:	TOTAL: \$144,086	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Foster, W. A.	MSFC/Dozier, J.	49-Engr, NEC	
Shoemaker, W. L.	MSFC/Hollis, R.		
NAS 8-36471	Auburn University	1040	Surface analysis of Solar Maximum Mission and long duration exposure facility specimen
<i>Period</i>	<i>Obligations</i>		
03/26/85-07/31/90	FY89: \$30,000	TOTAL: \$193,992	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Fromhold, A. T.	MSFC/Carruth, M. R.	13-Physics	
Williams, J. R.	MSFC/Whitaker, A. F.		
Dancshvar, K.			
NAS 8-36654	Auburn University	1041	Hydrogen induced fracture characteristics of nickel base superalloys
<i>Period</i>	<i>Obligations</i>		
10/29/86-06/09/89	FY89:	TOTAL: \$76,302	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Crocker, M. J.	MSFC/Parr, R. A.	31-Atmos Sci	
	MSFC/Bhat, B. N.		
NAS 8-37232	Auburn University	1042	Characterization of weld radiograph enigma phenomena in 2219 T87 aluminum
<i>Period</i>	<i>Obligations</i>		
09/14/87-09/13/89	FY89: \$44,285	TOTAL: \$89,285	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Jemian, W. A.	MSFC/Nunes, A.	19-Phys Sci, NEC	
	MSFC/Bayless, E.		
NAS 8-38083	Auburn University	1043	Fracture mechanisms in ATD roller bearing
<i>Period</i>	<i>Obligations</i>		
07/05/89-07/04/90	FY89: \$29,197	TOTAL: \$29,197	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Zee, R. H.	MSFC/Lee, J. E.	46-Mech Engr	
	MSFC/Bhat, B. N.		
NAS 8-38184	Auburn University	1044	Hydrogen induced fracture characteristics of nick 1 base superalloys
<i>Period</i>	<i>Obligations</i>		
06/19/89-06/18/90	FY89: \$48,950	TOTAL: \$48,950	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Wilcox, R. C.	MSFC/Gentz, S. J.	31-Atmos Sci	
	MSFC/Bhat, B. N.		
NCC 3-83	Auburn University	1045	Kinetics and mechanisms of materials degradation and surface behavior in simulated space environments in situ compositional and structural studies using electron spectroscopic and electron
<i>Period</i>	<i>Obligations</i>		
04/01/87-04/03/90	FY89: \$50,000	TOTAL: \$150,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Tatarchuk, B. J.	LERC/Gulino, D. A.	19-Phys Sci, NEC	
Baker, R. T.	LERC/Banks, B. A.		

NASA'S UNIVERSITY PROGRAM **ALABAMA (Continued)**

NCC 8-14 Auburn University 1046
Development of a program analysis environment for ADA
Period Obligations
05/27/88-06/12/90 FY89: \$300,000 TOTAL: \$415,000
Prin. Invest. NASA Tech. Officer CASE Category
Brown, D. B. MSFC/Shackleford, K. 22-Computer Science
MSFC/White, C. H.

NGT 00-050-531 Auburn University 1055
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Tzeng, Y. HQ-XE/Owens, F. C. 45-Elec Engr

NGT 00-050-084 Auburn University 1047
NASA graduate student researchers program
Period Obligations
09/15/86-09/14/89 FY89: \$18,000 TOTAL: \$51,500
Prin. Invest. NASA Tech. Officer CASE Category
Jang, B. HQ-LE/Owens, F. C. 47-Materials Engr

NGT 00-070-094 Auburn University 1056
NASA graduate student researchers program
Period Obligations
09/16/88-09/15/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Tzeng, Y. HQ-XE/Owens, F. C. 45-Elec Engr

NGT 00-050-133 Auburn University 1048
NASA graduate student researchers program
Period Obligations
06/01/87-07/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Barnes, P. A. HQ-XE/Owens, F. C. 13-Physics

NGT 00-070-135 Auburn University 1057
NASA graduate student researchers underrepresented minority focus program
Period Obligations
09/16/89-09/15/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Askew, R. F. HQ-XE/Owens, F. C. 45-Elec Engr

NGT 00-050-353 Auburn University 1049
NASA graduate student researchers program
Period Obligations
08/01/88-07/31/89 FY89: TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Tatarchuk, B. J. HQ-XE/Owens, F. C. 99-Multi-Discip

NGT 01-003-801 Auburn University 1058
NASA graduate student researchers program
Period Obligations
06/16/85-06/15/88 FY89: TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Tatarchuk, B. J. HQ-LE/Owens, F. C. 43-Chem Engr

NGT 00-050-354 Auburn University 1050
NASA graduate student researchers program
Period Obligations
08/01/88-07/31/90 FY89: TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Tzeng, Y. HQ-XE/Owens, F. C. 45-Elec Engr

NAG 1-742 Tuskegee University 1059
Structure and properties of FM73 and related epoxy adhesives
Period Obligations
03/23/87-08/31/88 FY89: TOTAL: \$123,385
Prin. Invest. NASA Tech. Officer CASE Category
Jeelani, S. LARC/Johnson, W. S. 47-Materials Engr
Ludwick, A. G. LARC/Everett, R. A.

NGT 00-050-361 Auburn University 1051
NASA graduate student researchers program
Period Obligations
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Crocker, M. J. HQ-XE/Owens, F. C. 46-Mech Engr
Raju, P. K.

NAG 3-726 Tuskegee University 1060
Electrode erosion in low power constructed arc-jet thrusters
Period Obligations
05/01/86-12/31/89 FY89: TOTAL: \$64,939
Prin. Invest. NASA Tech. Officer CASE Category
Ray, P. R. LERC/Hardy, T. L. 49-Engr, NEC

NGT 00-050-374 Auburn University 1052
NASA graduate student researchers program
Period Obligations
08/01/88-06/15/90 FY89: \$36,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Moore, R. K. HQ-XE/Owens, F. C. 43-Chem Engr

NAG 8-20 Tuskegee University 1061
Research support for the school of engineering
Period Obligations
07/20/83-06/29/90 FY89: TOTAL: \$682,075
Prin. Invest. NASA Tech. Officer CASE Category
Ray, P. K. MSFC/Randall, J. L. 41-Aero Engr
Kumar, G. N. MSFC/Walker, R. J.

NGT 00-050-433 Auburn University 1053
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Zee, R. HQ-XE/Owens, F. C. 49-Engr, NEC

NAG 8-40 Tuskegee University 1062
Effects of interactions of protons, electrons and corona discharges on the electrical insulating materials used on solar cell arrays
Period Obligations
09/19/85-03/14/90 FY89: \$125,125 TOTAL: \$297,675
Prin. Invest. NASA Tech. Officer CASE Category
Doreswamy, C. V. MSFC/Randall, J. L. 45-Elec Engr
MSFC/Walker, R. W.

NGT 00-050-435 Auburn University 1054
NASA graduate student researchers program
Period Obligations
08/01/89-07/31/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Baginski, M. E. HQ-XE/Owens, F. C. 45-Elec Engr

NASA'S UNIVERSITY PROGRAM
ALABAMA (Continued)

NAG 8-44	Tuskegee University		1063
	Determination of residual stress distribution in machining quenched and tempered AlSi 4130 steel		
	<i>Period</i>	<i>Obligations</i>	
	09/23/85-04/17/88	FY89: TOTAL: \$39,438	
NAG 8-68	Tuskegee University		1064
	Characterization of high cycle fatigue behavior of selected materials		
	<i>Period</i>	<i>Obligations</i>	
	12/04/86-01/03/89	FY89: TOTAL: \$127,669	
NAG 8-77	Tuskegee University		1065
	Simulated fluid dynamics studies in the highly turbulent regime of the Lox post		
	<i>Period</i>	<i>Obligations</i>	
	12/04/86-03/05/90	FY89: TOTAL: \$99,196	
NAG 8-131	Tuskegee University		1066
	An investigation of the effects of environment and combined compression shear on the response of carbon thermoplastic composites		
	<i>Period</i>	<i>Obligations</i>	
	08/21/89-08/20/90	FY89: \$81,800 TOTAL: \$81,800	
NAGW 1599	Tuskegee University		1067
	Damping characterization in large structures		
	<i>Period</i>	<i>Obligations</i>	
	01/01/89-12/31/89	FY89: \$96,570 TOTAL: \$96,570	
NAG10-24	Tuskegee University		1068
	Sweet potato production in soilless culture for controlled environmental life support systems		
	<i>Period</i>	<i>Obligations</i>	
	10/28/85-10/31/89	FY89: \$45,425 TOTAL: \$645,425	
NAG10-31	Tuskegee University		1069
	Permeability of polymeric materials to condensable gases and organic liquids		
	<i>Period</i>	<i>Obligations</i>	
	03/07/86-08/15/89	FY89: TOTAL: \$161,187	
NAG10-62	Tuskegee University		1070
	Permeability of polymeric materials to condensable gases and organic		
	<i>Period</i>	<i>Obligations</i>	
	08/16/89-08/15/90	FY89: \$75,470 TOTAL: \$75,470	
NCC 2-455	Tuskegee University		1071
	Morphological examination of heart and testes tissues from hypokinetic animals		
	<i>Period</i>	<i>Obligations</i>	
	11/01/86-09/30/89	FY89: \$66,554 TOTAL: \$189,215	
NGT 00-050-130	Tuskegee University		1072
	NASA graduate student researchers program		
	<i>Period</i>	<i>Obligations</i>	
	06/01/87-05/31/89	FY89: TOTAL: \$36,000	
NAG 8-72	University of Alabama - Birmingham		1073
	Low gravity containerless processing of immiscible and glass forming alloys using the MSFC 100 meter drop tube		
	<i>Period</i>	<i>Obligations</i>	
	08/20/86-08/19/89	FY89: TOTAL: \$80,763	
NAG 8-640	University of Alabama - Birmingham		1074
	The influence of gravity on solidified microstructures in hypermonotectic alloys and dispersion strengthened composites		
	<i>Period</i>	<i>Obligations</i>	
	06/01/87-12/31/88	FY89: TOTAL: \$24,971	
NAG 8-685	University of Alabama - Birmingham		1075
	Microstructural characterization of II VI semiconducting alloys		
	<i>Period</i>	<i>Obligations</i>	
	09/01/87-09/01/89	FY89: \$55,167 TOTAL: \$94,708	
NAG 8-743	University of Alabama - Birmingham		1076
	Development of a compact multimode optical device for monitoring protein crystal growth		
	<i>Period</i>	<i>Obligations</i>	
	08/01/88-07/31/89	FY89: TOTAL: \$74,473	
NAG 8-763	University of Alabama - Birmingham		1077
	Develop an optical monitoring system for protein crystal growth hardware		
	<i>Period</i>	<i>Obligations</i>	
	02/08/89-02/07/90	FY89: \$198,398 TOTAL: \$198,398	
NAG 8-768	University of Alabama - Birmingham		1078
	Immiscible phase incorporation during directional solidification of hypermonotectics		
	<i>Period</i>	<i>Obligations</i>	
	04/01/89-03/31/90	FY89: \$100,000 TOTAL: \$100,000	

NASA'S UNIVERSITY PROGRAM **ALABAMA (Continued)**

NAGW 749 University of Alabama - Birmingham 1079
Cosmic ices and molecules-a laboratory investigation
Period *Obligations*
06/01/85-02/28/90 FY89: \$30,000 TOTAL: \$130,518
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wdowiak, T. J. HQ-EZ/Gillett, F. C. 13-Physics
HQ-EZ/Weiler, E. J.

NAGW 813 University of Alabama - Birmingham 1080
The commercial development of space in protein crystal growth
Period *Obligations*
09/15/85-10/30/89 FY89: \$1,442,439 TOTAL: \$3,569,935
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bugg HQ-IC/Oran, W. A. 51-Biological Sci
Delucas, L. J. HQ/Whitten, R. P.

NAGW 1512 University of Alabama - Birmingham 1081
The chemical basis for the origin of the genetic code and the process of protein synthesis
Period *Obligations*
12/01/88-11/30/89 FY89: \$81,000 TOTAL: \$81,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lacey, J. C. HQ-EB/Rummel, J. D. 12-Chemistry

NAS 8-36611 University of Alabama - Birmingham 1082
Protein crystal growth in a microgravity environment
Period *Obligations*
07/25/85-10/31/89 FY89: \$697,000 TOTAL: \$2,082,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bugg, C. E. MSFC/Herren, B. 51-Biological Sci
Delucas, L. J.
Baird, J. K.

NAS 8-38084 University of Alabama - Birmingham 1083
Effect of boron on intergranular hot cracking in ni Cr FE superalloys containing niobium
Period *Obligations*
06/29/89-03/28/90 FY89: \$51,569 TOTAL: \$51,569
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Thompson, R. G. MSFC/Gamwell, W. R. 47-Materials Engr
Davis, D. MSFC/Malone, T. W.
Chen, C.

NGR 01-010-001 University of Alabama - Birmingham 1084
Model for origin and coevolution of genetic code and the process of protein synthesis
Period *Obligations*
05/09/73-02/28/89 FY89: TOTAL: \$934,974
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lacey, J. C., Jr. HQ-EB/Rummel, J. D. 12-Chemistry
HQ-EB/Avernea, M.

NGT 00-050-040 University of Alabama - Birmingham 1085
NASA graduate student researchers program
Period *Obligations*
06/10/86-05/31/89 FY89: TOTAL: \$54,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Andrews, J. HQ-LE/Owens, F. C. 47-Materials Engr

NGT 02-002-800 University of Alabama - Birmingham 1086
NASA graduate student researchers program
Period *Obligations*
06/06/85-06/05/88 FY89: TOTAL: \$69,080
Prin. Invest. *NASA Tech. Officer* *CASE Category*
McAnulty, M. HQ-LE/Owens, F. C. 22-Computer Science

NGT 02-002-802 University of Alabama - Birmingham 1087
NASA graduate student researchers program
Period *Obligations*
06/01/85-05/31/88 FY89: TOTAL: \$54,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Agesti, D. G. HQ-LE/Owens, F. C. 13-Physics

NAG 1-972 University of Alabama - Huntsville 1088
Morphological stability and kinetics in crystal growth from vapors
Period *Obligations*
01/20/89-01/19/90 FY89: \$85,027 TOTAL: \$85,027
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Rosenberger, F. LARC/Fripp, A. L. 13-Physics

NAG 5-500 University of Alabama - Huntsville 1089
Analysis interpretation and role of ultra-violet radiation solar flow
Period *Obligations*
02/01/85-01/31/91 FY89: \$98,339 TOTAL: \$343,271
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Emslie, A. G. GSFC/Bullock, G. D. 13-Physics
GSFC/Gurman, J. B.

NAG 5-634 University of Alabama - Huntsville 1090
Rocket investigations of rapidly varying space plasma phenomena
Period *Obligations*
02/01/86-11/30/89 FY89: \$55,000 TOTAL: \$588,028
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Torbert, R. B. GSFC/Early, L. J. 19-Phys Sci, NEC
GSFC/Pless, R. H.

NAG 5-986 University of Alabama - Huntsville 1091
Flight instrument and scientific constraints on the comet rendezvous asteroid flyby mission
Period *Obligations*
09/01/87-02/01/90 FY89: TOTAL: \$64,668
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Torbert, R. B. GSFC/Scudder, J. D. 41-Aero Engr
GSFC/Ogilvie, K. W.

NAG 8-35 University of Alabama - Huntsville 1092
Numerical studies of the surface tension effect on the interface of a rotating fluid
Period *Obligations*
08/15/85-08/08/89 FY89: TOTAL: \$92,798
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hung, R. J. MSFC/Leslie, F. 13-Physics
MSFC/Spray, C.

NAG 8-52 University of Alabama - Huntsville 1093
Flare processes in the lower solar atmosphere
Period *Obligations*
10/30/85-03/31/90 FY89: \$10,010 TOTAL: \$126,010
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Emslie, A. G. MSFC/Davis, J. M. 11-Astronomy
Wilson, H. J. MSFC/Fields, S. A.
Lundquist, C. A.

NAG 8-53 University of Alabama - Huntsville 1094
Quantification of observed flare parameters in relation to shear index and verification of MHD models for flare prediction
Period *Obligations*
03/26/86-05/25/89 FY89: TOTAL: \$270,317
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wu, S. T. MSFC/Reichmann, E. J. 31-Atmos Sci
Smith, J. B. MSFC/Fields, S.

NASA'S UNIVERSITY PROGRAM
ALABAMA (Continued)

NAG 8-56 University of Alabama - Huntsville 1095
 Development of Faraday ring ammeter

Period	Obligations
03/31/86-09/29/88	FY89: TOTAL: \$324,616
Prin. Invest.	NASA Tech. Officer CASE Category
Torbert, R. B.	MSFC/Chappel, C. R. 13-Physics
	MSFC/Fields, S. A.

NAG 8-89 University of Alabama - Huntsville 1103
 Fourier transform infrared and Raman spectroscopic characterization of homogeneous solution concentration gradients near a container wall at different temperatures

Period	Obligations
04/14/87-12/31/89	FY89: TOTAL: \$51,000
Prin. Invest.	NASA Tech. Officer CASE Category
Loo, B. H.	MSFC/Frazier, D. O. 13-Physics
	MSFC/Facemire, B. R.

NAG 8-58 University of Alabama - Huntsville 1096
 Investigation of lunar energy space plasmas

Period	Obligations
03/31/86-04/30/89	FY89: TOTAL: \$895,122
Prin. Invest.	NASA Tech. Officer CASE Category
Wu, S. T.	MSFC/Chappel, C. R. 13-Physics
Horwitz, J. L.	MSFC/Fields, S. A.

NAG 8-92 University of Alabama - Huntsville 1104
 Comprehensive numerical schemes for predicting evaporating gas droplets flow processes of a liquid fueled combustor

Period	Obligations
06/24/87-06/19/90	FY89: \$57,813 TOTAL: \$168,587
Prin. Invest.	NASA Tech. Officer CASE Category
Chen, C. P.	MSFC/Bachtel, F. D. 49-Engr, NEC
	MSFC/Hutt, J. J.

NAG 8-60 University of Alabama - Huntsville 1097
 Compact imaging spectrometer for induced emissions

Period	Obligations
03/31/86-08/14/89	FY89: TOTAL: \$99,956
Prin. Invest.	NASA Tech. Officer CASE Category
Lundquist, C. A.	MSFC/Fields, S. A. 12-Chemistry
	MSFC/Cranie, G. M.

NAG 8-95 University of Alabama - Huntsville 1105
 Evaluation of Space Shuttle main engine computational fluid dynamics computer codes

Period	Obligations
09/22/87-09/21/90	FY89: \$50,000 TOTAL: \$150,000
Prin. Invest.	NASA Tech. Officer CASE Category
Chung, T. J.	MSFC/Wilhold, G. A. 43-Chem Engr
	MSFC/Eldridge, R.

NAG 8-63 University of Alabama - Huntsville 1098
 Turbulence and gravity waves in the tropical upper atmosphere

Period	Obligations
07/30/86-07/29/89	FY89: TOTAL: \$160,826
Prin. Invest.	NASA Tech. Officer CASE Category
Hung, R. J.	MSFC/Johnson, D. 31-Atmos Sci
	MSFC/Spray, C.

NAG 8-96 University of Alabama - Huntsville 1106
 Silicon inversion layer IL MOS solar cells and arrays

Period	Obligations
09/17/87-09/16/89	FY89: TOTAL: \$24,994
Prin. Invest.	NASA Tech. Officer CASE Category
Ho, F. D.	MSFC/Edge, T. M. 45-Elec Engr
	MSFC/Norton, A.

NAG 8-65 University of Alabama - Huntsville 1099
 Measurement of direct electron pairs in emulsions exposed to relativistic heavy ions

Period	Obligations
04/15/86-02/07/89	FY89: TOTAL: \$74,993
Prin. Invest.	NASA Tech. Officer CASE Category
Gregory, J. C.	MSFC/Parnoll, T. A. 13-Physics
	MSFC/Strauss, E. M.

NAG 8-98 University of Alabama - Huntsville 1107
 Novel protein crystal growth technology proof of concept

Period	Obligations
12/01/87-11/30/88	FY89: TOTAL: \$30,000
Prin. Invest.	NASA Tech. Officer CASE Category
Nyce, T. A.	MSFC/Kroes, R. L. 13-Physics
Rosenberger, F.	

NAG 8-67 University of Alabama - Huntsville 1100
 A direct time of flight measurement of the one way velocity of light

Period	Obligations
05/23/86-02/12/89	FY89: TOTAL: \$116,469
Prin. Invest.	NASA Tech. Officer CASE Category
Torr, D. G.	MSFC/Decher, R. 12-Chemistry
	MSFC/Eby, P. B.

NAG 8-100 University of Alabama - Huntsville 1108
 Space vehicle contamination study

Period	Obligations
05/05/88-07/05/89	FY89: TOTAL: \$106,515
Prin. Invest.	NASA Tech. Officer CASE Category
Torr, D. G.	MSFC/Fields, S. A. 41-Aero Engr
	MSFC/Reed, L. S.

NAG 8-82 University of Alabama - Huntsville 1101
 Investigation of the atmosphere of the outer planets

Period	Obligations
11/18/86-11/17/89	FY89: TOTAL: \$130,519
Prin. Invest.	NASA Tech. Officer CASE Category
Comfort, R. H.	MSFC/Waite, J. H. 11-Astronomy
	MSFC/Fields, S. A.

NAG 8-102 University of Alabama - Huntsville 1109
 Combustion diagnostics study of temperature and density profiles for water vapor and hydroxyl radicals

Period	Obligations
04/15/88-04/14/89	FY89: TOTAL: \$54,581
Prin. Invest.	NASA Tech. Officer CASE Category
Hung, R. J.	MSFC/Eskridge, R. H. 13-Physics
	MSFC/Bachtel, F. D.

NAG 8-83 University of Alabama - Huntsville 1102
 Computer modeling of inversion layer MOS solar cells and arrays

Period	Obligations
10/03/86-06/02/89	FY89: TOTAL: \$14,994
Prin. Invest.	NASA Tech. Officer CASE Category
Olson, L. H.	MSFC/Edge, T. M. 22-Computer Science
	MSFC/Norton, A.

NASA'S UNIVERSITY PROGRAM **ALABAMA (Continued)**

NAG 8-108 University of Alabama - Huntsville 1110
 Large area inversion layer metal insulator semiconductor il mis solar cells and arrays
Period *Obligations*
 05/25/88-05/25/90 FY89: \$29,994 TOTAL: \$54,990
Prin. Invest. *NASA Tech. Officer*
 Ho, F. D. MSFC/Edge, T. CASE Category
 MSFC/Norton, O. A. 45-Elec Engr

NAG 8-117 University of Alabama - Huntsville 1111
 Hubble space telescope design engineering knowledge base HSTDEK
Period *Obligations*
 09/12/88-09/12/89 FY89: TOTAL: \$48,474
Prin. Invest. *NASA Tech. Officer*
 Johannes, J. D. MSFC/Freeman, M. S. CASE Category
 MSFC/Franks, G. 22-Computer Science

NAG 8-122 University of Alabama - Huntsville 1112
 Testing and management of flight instruments and their data
Period *Obligations*
 12/01/88-12/01/91 FY89: \$98,993 TOTAL: \$98,993
Prin. Invest. *NASA Tech. Officer*
 Comfort, R. H. MSFC/Fields, S. CASE Category
 MSFC/McCranie, G. 13-Physics

NAG 8-128 University of Alabama - Huntsville 1113
 Development of generalized pressure-velocity coupling scheme
Period *Obligations*
 05/19/89-05/19/92 FY89: \$82,003 TOTAL: \$82,003
Prin. Invest. *NASA Tech. Officer*
 Chen, C. P. MSFC/Gross, K. W. CASE Category
 Wu, F. S. MSFC/Trinh, H. P. 49-Engr, NEC

NAG 8-129 University of Alabama - Huntsville 1114
 Numerical studies of the surface tension effect on the rotating helium dewey in GP-B spacecraft
Period *Obligations*
 03/29/89-05/29/90 FY89: \$33,302 TOTAL: \$33,302
Prin. Invest. *NASA Tech. Officer*
 Hung, R. J. MSFC/Leslie, F. W. CASE Category
 MSFC/Kaufman, J. W. 47-Materials Engr

NAG 8-134 University of Alabama - Huntsville 1115
 Space plasma physics research
Period *Obligations*
 07/13/89-07/12/90 FY89: \$197,281 TOTAL: \$197,281
Prin. Invest. *NASA Tech. Officer*
 Comfort, R. H. MSFC/Chisholm, W. L. CASE Category
 Horwitz, J. L. MSFC/Chandler, M. O. 13-Physics

NAG 8-135 University of Alabama - Huntsville 1116
 Polarization analysis methods for AXAF
Period *Obligations*
 07/11/89-07/10/90 FY89: \$11,963 TOTAL: \$11,963
Prin. Invest. *NASA Tech. Officer*
 Chipman, R. A. MSFC/Bilbro, J. W. CASE Category
 11-Astronomy

NAG 8-511 University of Alabama - Huntsville 1117
 Verification of the critical point wetting theory using microgravity
Period *Obligations*
 01/18/85-07/18/89 FY89: TOTAL: \$99,997
Prin. Invest. *NASA Tech. Officer*
 Kaukler, W. F. MSFC/Black, R. E. CASE Category
 21-Mathematics

NAG 8-627 University of Alabama - Huntsville 1118
 Development of computerized analysis for solid propellant combustion
Period *Obligations*
 05/05/87-12/31/88 FY89: TOTAL: \$80,000
Prin. Invest. *NASA Tech. Officer*
 Chung, T. J. MSFC/Martin, C. CASE Category
 29-Math/Computer, NEC

NAG 8-641 University of Alabama - Huntsville 1119
 Application of artificial intelligence to space station
Period *Obligations*
 10/01/87-09/30/88 FY89: TOTAL: \$138,000
Prin. Invest. *NASA Tech. Officer*
 Ford, D. R. MSFC/Wolfsberger, J. W. CASE Category
 29-Math/Computer, NEC

NAG 8-642 University of Alabama - Huntsville 1120
 Data reduction of knowledge based system
Period *Obligations*
 06/01/87-05/31/89 FY89: \$19,750 TOTAL: \$183,889
Prin. Invest. *NASA Tech. Officer*
 Ford, D. R. MSFC/Weeks, D. CASE Category
 MSFC/Walls, B. K. 22-Computer Science

NAG 8-654 University of Alabama - Huntsville 1121
 Analysis and modeling of summertime connective cloud and precipitation structure over the Southeastern United States
Period *Obligations*
 09/15/87-06/14/90 FY89: \$85,000 TOTAL: \$239,988
Prin. Invest. *NASA Tech. Officer*
 Knupp, K. R. MSFC/Robertson, F. R. CASE Category
 31-Atmos Sci

NAG 8-682 University of Alabama - Huntsville 1122
 Coordination of advanced solar observatory science working group for the study of instrument accommodation and operational requirements on space station
Period *Obligations*
 08/01/87-04/30/89 FY89: TOTAL: \$45,501
Prin. Invest. *NASA Tech. Officer*
 Wu, S. T. MSFC/Roberts, W. T. CASE Category
 13-Physics

NAG 8-684 University of Alabama - Huntsville 1123
 Process modelling for space station experiments
Period *Obligations*
 10/01/87-09/30/90 FY89: TOTAL: \$244,000
Prin. Invest. *NASA Tech. Officer*
 Rosenberger, F. MSFC/Bass, B. G. CASE Category
 MSFC/Newmann, R. J. 13-Physics

NAG 8-686 University of Alabama - Huntsville 1124
 Development of an endoscopic probe for radial metrology
Period *Obligations*
 09/22/87-06/21/88 FY89: TOTAL: \$95,000
Prin. Invest. *NASA Tech. Officer*
 Gilbert, J. A. MSFC/Richards, J. S. CASE Category
 49-Engr, NEC

NAG 8-692 University of Alabama - Huntsville 1125
 Temperature gradients in the plasmasphere
Period *Obligations*
 12/01/87-07/31/89 FY89: TOTAL: \$27,428
Prin. Invest. *NASA Tech. Officer*
 Comfort, R. H. MSFC/Chandler, M. O. CASE Category
 13-Physics

NASA'S UNIVERSITY PROGRAM **ALABAMA (Continued)**

NAG 8-698 University of Alabama - Huntsville 1126
Environmental control medical support team
Period *Obligations*
12/01/87-12/07/88 FY89: TOTAL: \$95,201
Prin. Invest. NASA Tech. Officer CASE Category
Crump, W. J. MSFC/Hueter, U. 59-Life Sci, NEC

NAG 8-704 University of Alabama - Huntsville 1127
Fluid dynamics and low gravity effects of chemical vapor deposition
Period *Obligations*
02/22/88-02/21/90 FY89: \$97,802 TOTAL: \$193,212
Prin. Invest. NASA Tech. Officer CASE Category
Rosenberger, F. E. MSFC/Lehoczkzy, S. L. 32-Geological Sci

NAG 8-706 University of Alabama - Huntsville 1128
OMV/man systems simulation integration
Period *Obligations*
02/10/88-09/30/89 FY89: TOTAL: \$83,679
Prin. Invest. NASA Tech. Officer CASE Category
Rogers, J. G. MSFC/Hale, J. P. 49-Engr, NEC

NAG 8-708 University of Alabama - Huntsville 1129
High temperature modeling and performance verifications
Period *Obligations*
03/01/88-02/28/90 FY89: \$51,996 TOTAL: \$124,996
Prin. Invest. NASA Tech. Officer CASE Category
Smith, J. E. MSFC/Poorman, R. M. 19-Phys Sci, NEC
MSFC/Yates, I. C.

NAG 8-711 University of Alabama - Huntsville 1130
Nucleation of growth control in protein
Period *Obligations*
03/14/88-03/14/90 FY89: \$117,046 TOTAL: \$215,851
Prin. Invest. NASA Tech. Officer CASE Category
Rosenberger, F. E. MSFC/Snyder, R. 39-Env Sci, NEC

NAG 8-717 University of Alabama - Huntsville 1131
Artificial intelligence to MSFC mission planning for space station
Period *Obligations*
06/01/88-08/04/90 FY89: \$110,000 TOTAL: \$190,000
Prin. Invest. NASA Tech. Officer CASE Category
Ford, D. ARC/Lindberg, J. P. 49-Engr, NEC
Floyd, S. ARC/Causey, W. E.

NAG 8-720 University of Alabama - Huntsville 1132
Network system and status electrical power system breadboard
Period *Obligations*
06/01/88-06/01/90 FY89: TOTAL: \$72,176
Prin. Invest. NASA Tech. Officer CASE Category
McKee, J. W. MSFC/Whitehead, N. D. 22-Computer Science

NAG 8-724 University of Alabama - Huntsville 1133
Vibration technology sensitivity of selected classes of space experiments to residual accelerations
Period *Obligations*
07/01/88-06/30/90 FY89: \$141,753 TOTAL: \$276,336
Prin. Invest. NASA Tech. Officer CASE Category
Alexander, J. I. MSFC/Morroni, C. A. 49-Engr, NEC
MSFC/Schafer, C. F.

NAG 8-733 University of Alabama - Huntsville 1134
Elevation of advanced light scattering technology for microgravity experiments
Period *Obligations*
07/01/88-07/01/90 FY89: \$141,745 TOTAL: \$267,783
Prin. Invest. NASA Tech. Officer CASE Category
Fredericks, W. J. MSFC/Witherow, W. K. 19-Phys Sci, NEC
MSFC/Pusey, M. L.

NAG 8-759 University of Alabama - Huntsville 1135
Residual acceleration data on IML-1: Determination of experiment sensitivity; and efficient data dissemination
Period *Obligations*
03/01/89-03/01/90 FY89: \$188,843 TOTAL: \$188,843
Prin. Invest. NASA Tech. Officer CASE Category
Alexander, J. I. MSFC/Snyder, R. S. 11-Astronomy

NAG 8-767 University of Alabama - Huntsville 1136
The growth of zinc selenide single crystals by physical vapor transport in microgravity
Period *Obligations*
04/01/89-03/31/90 FY89: \$179,998 TOTAL: \$179,998
Prin. Invest. NASA Tech. Officer CASE Category
Anderson, E. E. MSFC/Lehoczkzy, S. L. 13-Physics
Cheng, H. Y.
Rosenberger, F. E.

NAG 8-777 University of Alabama - Huntsville 1137
Exploration of operator method digital optical computers for applications to MSFC
Period *Obligations*
04/30/89-10/30/89 FY89: \$59,997 TOTAL: \$59,997
Prin. Invest. NASA Tech. Officer CASE Category
Caulfield, H. J. MSFC/Jones, C. O. 29-Math/Computer, NEC

NAG 8-790 University of Alabama - Huntsville 1138
Process modelling for material preparation experiment
Period *Obligations*
08/01/89-11/30/89 FY89: \$100,105 TOTAL: \$100,105
Prin. Invest. NASA Tech. Officer CASE Category
Rosenberger, F. E. MSFC/Lehoczkzy, S. L. 31-Atmos Sci
Alexander, J. I.
Ouazzani, J.

NAGW 9 University of Alabama - Huntsville 1139
Dynamical behavior of a flaring loop (a two dimensional, time-dependent MHD (magnetohydrodynamic) flux tube model
Period *Obligations*
10/01/79-12/31/89 FY89: \$43,000 TOTAL: \$716,461
Prin. Invest. NASA Tech. Officer CASE Category
Wu, S. T. HQ-ES/Ahluwalia, H. S. 13-Physics
HQ-ES/Kane, S.

NAGW 294 University of Alabama - Huntsville 1140
Impulsive X-ray emission in solar flares
Period *Obligations*
04/01/82-12/31/89 FY89: \$52,000 TOTAL: \$293,794
Prin. Invest. NASA Tech. Officer CASE Category
Emslie, A. G. HQ-ES/Ahluwalia, H. S. 13-Physics
HQ-EZ/Bohlin, J. D.

NASA'S UNIVERSITY PROGRAM
ALABAMA (Continued)

NAGW 812 University of Alabama - Huntsville 1141			
The commercial development of space in materials processing			
<i>Period</i>	<i>Obligations</i>		
09/15/85-09/14/89	FY89: \$2,060,678	TOTAL: \$7,031,678	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Lundquist, C.	HQ-IC/Oran, W. A.	47-Materials Engr	
Wessling, E.	HQ/Whitten, R. P.		
NAGW 847 University of Alabama - Huntsville 1142			
Personnel occupied woven envelope robot (power)			
<i>Period</i>	<i>Obligations</i>		
12/01/85-06/30/88	FY89:	TOTAL: \$199,324	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Wessling, F. C.	HQ-E/Rosendhal, J. D.	49-Engr, NEC	
	HQ-EP/Konkel, R. M.		
NAGW 922 University of Alabama - Huntsville 1143			
Continued research Spacelab 1 TSO data			
<i>Period</i>	<i>Obligations</i>		
08/01/86-07/31/89	FY89: \$68,000	TOTAL: \$204,410	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Torr, D. G.	HQ-ES/Mellott, M. M.	13-Physics	
	HQ-ES/Perry, T. W.		
NAGW 996 University of Alabama - Huntsville 1144			
A simple three dimensional dynamical model of the thermal plasma in the plasmasphere			
<i>Period</i>	<i>Obligations</i>		
01/01/87-12/31/89	FY89: \$50,000	TOTAL: \$120,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Richards, P. G.	HQ-ES/Mellott, M. M.	13-Physics	
Torr, D. G.	HQ-ES/Perry, T. W.		
NAGW 1117 University of Alabama - Huntsville 1145			
Stip symposium on physical interpretation of solar interplanetary and cometary intervals			
<i>Period</i>	<i>Obligations</i>		
04/01/87-06/30/88	FY89: \$80,000	TOTAL: \$84,966	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Wu, S. T.	HQ-EE/Vinas, A. F.	31-Atmos Sci	
	HQ-EE/Eastman, T. E.		
NAGW 1165 University of Alabama - Huntsville 1146			
Gravity wave initiated convection and coupling between lower and upper atmosphere in subtropical regions			
<i>Period</i>	<i>Obligations</i>		
10/01/87-07/31/90	FY89:	TOTAL: \$146,997	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hung, R. J.	HQ-EE/Dodge, J. D.	31-Atmos Sci	
	HQ-EE/Theon, J.		
NAGW 1554 University of Alabama - Huntsville 1147			
Time dependent polar plasma outflow modeling and observations			
<i>Period</i>	<i>Obligations</i>		
01/01/89-12/31/89	FY89: \$63,512	TOTAL: \$63,512	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Horwitz, J. L.	HQ-ES/Mellott, M. M.	13-Physics	
	HQ-ES/Perry, T. W.		
NAGW 1562 University of Alabama - Huntsville 1148			
Electrodynamics of body plasma interactions in space			
<i>Period</i>	<i>Obligations</i>		
02/01/89-01/31/90	FY89: \$49,971	TOTAL: \$49,971	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Singh, N.	HQ-ES/Mellott, M. M.	99-Multi-Discip	
	HQ-ES/Perry, T. W.		
NAGW 1586 University of Alabama - Huntsville 1149			
A new space instrument for measuring electric currents			
<i>Period</i>	<i>Obligations</i>		
02/01/89-01/31/90	FY89: \$143,834	TOTAL: \$143,834	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Torbert, R. B.	HQ-E/Alexander, J. K.	13-Physics	
	HQ-E/Holland, D. A.		
NAGW 1630 University of Alabama - Huntsville 1150			
Effects of plasmasphere heating on thermal ion composition			
<i>Period</i>	<i>Obligations</i>		
03/01/89-02/28/90	FY89: \$40,000	TOTAL: \$40,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Comfort, R. H.	HQ-ES/Mellott, M. M.	13-Physics	
	HQ-ES/Perry, T. W.		
NAGW 1651 University of Alabama - Huntsville 1151			
New methods for transition radiation measurement average mass evaluation and particle tracking in magnetic field using nuclear emulsions in space			
<i>Period</i>	<i>Obligations</i>		
03/01/89-02/28/90	FY89: \$60,000	TOTAL: \$60,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Takahashi, Y.	HQ-ES/Mellott, M. M.	13-Physics	
	HQ-ES/Perry, T. W.		
NAS 1-18683 University of Alabama - Huntsville 1152			
Acceleration measurement and management I t E program			
<i>Period</i>	<i>Obligations</i>		
06/08/88-12/31/89	FY89:	TOTAL: \$102,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Alexander, J. I.	LARC/Clark, L. G.	42-Astro Engr	
	LARC/Blanchard, R. C.		
NAS 3-25361 University of Alabama - Huntsville 1153			
Outreach definition study vapor crystal growth			
<i>Period</i>	<i>Obligations</i>		
10/01/88-03/31/90	FY89:	TOTAL: \$110,235	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Rosenberger, F. E.	LERC/Duvall, W.	47-Materials Engr	
Wessling, F. C.			
NAS 5-30540 University of Alabama - Huntsville 1154			
Development of data processing units for wind and polar spacecraft of ISTP			
<i>Period</i>	<i>Obligations</i>		
02/27/89-06/30/91	FY89: \$250,000	TOTAL: \$250,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Torbert, R. B.	GSFC/Ogilvie, K.	22-Computer Science	
NAS 8-35354 University of Alabama - Huntsville 1155			
Research study: Space radiation studies			
<i>Period</i>	<i>Obligations</i>		
07/22/83-06/30/89	FY89:	TOTAL: \$231,768	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Takahashi, Y.	MSFC/Parnell, T. A.	13-Physics	
	MSFC/Watts, J.		
NAS 8-35362 University of Alabama - Huntsville 1156			
Cell partition in two polymer aqueous phases			
<i>Period</i>	<i>Obligations</i>		
07/21/83-12/31/89	FY89: \$50,000	TOTAL: \$282,618	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Harris, J. M.	MSFC/Gardner, L. B.	59-Life Sci, NEC	

NASA'S UNIVERSITY PROGRAM **ALABAMA (Continued)**

NAS 8-36102 University of Alabama - Huntsville 1157		NAS 8-36955 University of Alabama - Huntsville 1165	
Support QASO study group		Essential education engineering research and development capability	
<i>Period</i>	<i>Obligations</i>	<i>Period</i>	<i>Obligations</i>
07/09/84-04/14/88	FY89: TOTAL: \$218,479	06/06/88-06/05/93	FY89: \$4,044,713 TOTAL: \$4,225,222
<i>Prin. Invest.</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>CASE Category</i>
Wu, S. T.	MSFC/Roberts, W. T. 31-Atmos Sci	Workman, G.	MSFC/Smith, L. J. 99-Multi-Discip
			MSFC/Robinson, M. B.
NAS 8-36279 University of Alabama - Huntsville 1158		NAS 8-37106 University of Alabama - Huntsville 1166	
Evaluation of the magnitude and scale of atmospheric physical processes in relation to space sensor design and development		Imaging spectrometric observatory for the Atlas 1 mission	
<i>Period</i>	<i>Obligations</i>	<i>Period</i>	<i>Obligations</i>
03/24/86-06/23/89	FY89: \$24,536 TOTAL: \$990,753	02/13/87-04/15/92	FY89: \$399,250 TOTAL: \$772,250
<i>Prin. Invest.</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>CASE Category</i>
McNider, R. T.	MSFC/Greene, W. M. 31-Atmos Sci	Torr, D. G.	MSFC/Hill, H. C. 31-Atmos Sci
	MSFC/Smith, G. T.		MSFC/Ise, R.
NAS 8-36362 University of Alabama - Huntsville 1159		NAS 8-37107 University of Alabama - Huntsville 1167	
Burst and transient source experiment for the gamma ray observatory		Research on orbital plasma electrodynamics	
<i>Period</i>	<i>Obligations</i>	<i>Period</i>	<i>Obligations</i>
03/04/87-09/15/89	FY89: \$30,075 TOTAL: \$334,013	03/17/87-03/31/92	FY89: \$77,000 TOTAL: \$230,272
<i>Prin. Invest.</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>CASE Category</i>
Paciesas, W. S.	MSFC/Fishman, G. J. 11-Astronomy	Ston, N.	MSFC/Duncan, B. 31-Atmos Sci
		Wu, S. T.	MSFC/Holder, R.
		Singh, N.	
NAS 8-36479 University of Alabama - Huntsville 1160		NAS 8-37139 University of Alabama - Huntsville 1168	
Numerical investigation of mesoscale pre-convection forcing mechanisms and evaluation of satellite resolution of these mechanisms		The design and development of an interactive data management and analysis system for remote sensing and conventional meteorological observation	
<i>Period</i>	<i>Obligations</i>	<i>Period</i>	<i>Obligations</i>
09/11/85-09/11/91	FY89: \$50,000 TOTAL: \$974,759	12/24/87-12/24/90	FY89: TOTAL: \$331,130
<i>Prin. Invest.</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>CASE Category</i>
McNider, R. T.	MSFC/Arnold, J. 31-Atmos Sci	McNider, R. T.	MSFC/Wilson, G. S. 31-Atmos Sci
	MSFC/Robertson, F. R.		
NAS 8-36485 University of Alabama - Huntsville 1161		NAS 8-37195 University of Alabama - Huntsville 1169	
Heat treatment study of MAR-M246		Research study for chemical waste disposal in space by plasma discharge	
<i>Period</i>	<i>Obligations</i>	<i>Period</i>	<i>Obligations</i>
09/17/85-11/30/88	FY89: TOTAL: \$92,950	09/21/88-09/20/90	FY89: \$59,300 TOTAL: \$144,300
<i>Prin. Invest.</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>CASE Category</i>
Workman, G. L.	MSFC/Lee, J. E. 13-Physics	Baird, J. K.	MSFC/Higgins, D. 12-Chemistry
	MSFC/Spray, C.		MSFC/Congo, R.
NAS 8-36620 University of Alabama - Huntsville 1162		NAS 8-37348 University of Alabama - Huntsville 1170	
Drop tube drop tower, KC 135 and F-104 experiment operations tasks		Design phase of ISTP digital consortium	
<i>Period</i>	<i>Obligations</i>	<i>Period</i>	<i>Obligations</i>
10/01/85-12/31/88	FY89: \$44,290 TOTAL: \$1,704,296	03/25/87-03/25/90	FY89: TOTAL: \$123,492
<i>Prin. Invest.</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>CASE Category</i>
Workman, G. L.	MSFC/Robinson, M. B. 19-Phys Sci, NEC	Torbert, R. B.	MSFC/Fields, S. A. 13-Physics
			MSFC/Chappell, C. R.
NAS 8-36645 University of Alabama - Huntsville 1163		NAS 8-37576 University of Alabama - Huntsville 1171	
Partial analysis of LDEF experiment a 0114 study:		Engineering support for an ultraviolet imager for the ISTP mission	
<i>Period</i>	<i>Obligations</i>	<i>Period</i>	<i>Obligations</i>
05/20/85-11/19/91	FY89: TOTAL: \$17,900	11/23/87-01/22/89	FY89: TOTAL: \$63,000
<i>Prin. Invest.</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>CASE Category</i>
Gregory, J. C.	MSFC/Peters, P. N. 12-Chemistry	Torr, D.	MSFC/Fields, S. 19-Phys Sci, NEC
	MSFC/Muler, E. R.		MSFC/Reed, L. S.
NAS 8-36718 University of Alabama - Huntsville 1164		NAS 8-37585 University of Alabama - Huntsville 1172	
Theoretical and experimental fluid dynamics studies for space flight payload definition		Space sensor and development interpretation	
<i>Period</i>	<i>Obligations</i>	<i>Period</i>	<i>Obligations</i>
09/04/86-09/03/90	FY89: \$134,780 TOTAL: \$646,027	01/31/89-01/31/92	FY89: \$540,107 TOTAL: \$540,107
<i>Prin. Invest.</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>CASE Category</i>
McNider, R. T.	MSFC/Kaufman, J. W. 29-Math/Computer, NEC	McNider, R. T.	MSFC/Arnold, J. 31-Atmos Sci
Schroer, B. J.	MSFC/Fichtl, G. H.		

NASA'S UNIVERSITY PROGRAM **ALABAMA (Continued)**

NAS 8-37586 University of Alabama - Huntsville 1173
Engineering support for an ultraviolet imager for the ITSP mission
Period *Obligations*
12/16/88-12/16/89 FY89: \$618,985 TOTAL: \$618,985
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Torr, D. G. MSFC/Fields, S. A. 31-Atmos Sci

NAS 8-37751 University of Alabama - Huntsville 1174
Development of emulsion chamber tech for cosmic ray and high energy physics research in space station era
Period *Obligations*
08/17/88-11/16/89 FY89: TOTAL: \$201,241
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Gregory, J. MSFC/Parnell, T. A. 13-Physics
MSFC/Derrickson, J. H.

NAS 8-37886 University of Alabama - Huntsville 1175
A fast electron spectrometer and versatile burst memory for Crees Leol
Period *Obligations*
12/12/88-05/11/93 FY89: \$50,973 TOTAL: \$50,973
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Torbert, R. B. MSFC/Stone, J. F. 13-Physics

NAS 8-38078 University of Alabama - Huntsville 1176
Two color holography concept (t-chi)
Period *Obligations*
05/11/89-03/11/90 FY89: \$101,796 TOTAL: \$101,796
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Caulfield, H. J. MSFC/Witherow, W. 31-Atmos Sci

NAS 9-17962 University of Alabama - Huntsville 1177
Laser welding technology in space experiment
Period *Obligations*
05/09/88-07/01/89 FY89: \$168 TOTAL: \$114,496
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Workman, G. L. JSC/Bennett, J. E. 47-Materials Engr

NAS 9-17973 University of Alabama - Huntsville 1178
Definition of a microbiological monitor for application in space vehicles
Period *Obligations*
06/01/88-09/01/89 FY89: TOTAL: \$105,460
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Kilgore, M. V. JSC/Pierson, D. 51-Biological Sci

NCC 8-2 University of Alabama - Huntsville 1179
High temperature superconductors
Period *Obligations*
06/26/87-08/26/88 FY89: TOTAL: \$79,995
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wu, M. K. MSFC/Curreri, P. A. 49-Engr, NEC
MSFC/Strauss, E. M.

NCC 8-4 University of Alabama - Huntsville 1180
Stress and fatigue studies of formed metal bellows
Period *Obligations*
10/23/87-10/22/88 FY89: TOTAL: \$186,561
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Guinn, G. R. MSFC/Tygielski, P. J. 46-Mech Engr
Schonberg, W. P.

NCC 8-13 University of Alabama - Huntsville 1181
Foundation for automated software techniques and application of artificial intelligence
Period *Obligations*
06/01/88-05/31/91 FY89: TOTAL: \$391,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Ford, D. R. MSFC/Wolfsberger, J. W. 49-Engr, NEC
MSFC/White, C. H.

NCC 8-15 University of Alabama - Huntsville 1182
Characterize fluid flow digital correlation of sca fluid flow digital correlation of scattered light
Period *Obligations*
08/01/88-07/10/89 FY89: TOTAL: \$157,775
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Gilbert, J. A. MSFC/Ruff, R. C. 19-Phys Sci, NEC

NCC 8-16 University of Alabama - Huntsville 1183
Computer vision systems for space station
Period *Obligations*
08/01/88-07/31/90 FY89: \$58,896 TOTAL: \$114,085
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Ranganath, H. S. MSFC/Vinz, F. L. 22-Computer Science
MSFC/Denton, J. S.

NGT 00-050-044 University of Alabama - Huntsville 1184
NASA graduate student researchers program
Period *Obligations*
09/01/86-10/31/89 FY89: TOTAL: \$54,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Emslie, A. G. HQ-LE/Owens, F. C. 13-Physics

NGT 00-050-124 University of Alabama - Huntsville 1185
NASA graduate student researchers program
Period *Obligations*
06/01/87-07/31/89 FY89: TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Anderson, E. E. HQ-LE/Owens, F. C. 13-Physics

NGT 00-050-129 University of Alabama - Huntsville 1186
NASA graduate student researchers program
Period *Obligations*
09/01/87-08/31/90 FY89: TOTAL: \$34,900
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Rosenberger, F. HQ-LE/Owens, F. C. 22-Computer Science

NGT 00-050-224 University of Alabama - Huntsville 1187
NASA graduate student researchers program
Period *Obligations*
09/01/87-08/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Goldberg, D. E. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 00-050-355 University of Alabama - Huntsville 1188
NASA graduate student researchers program
Period *Obligations*
09/01/88-08/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Torr, D. G. HQ-XE/Owens, F. C. 13-Physics

NASA'S UNIVERSITY PROGRAM

ALABAMA (Continued)

NGT 00-050-432 University of Alabama - Huntsville 1189
 NASA graduate student researchers program

Period	Obligations	
07/01/89-06/30/90	FY89: \$18,000	TOTAL: \$18,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Chen, C. P.	HQ-XE/Owens, F. C.	49-Engr, NEC

NGT 01-008-021 University of Alabama - Huntsville 1190
 Summer faculty fellowship program

Period	Obligations	
01/01/76-03/31/90	FY89: \$316,061	TOTAL: \$2,158,374
Prin. Invest.	NASA Tech. Officer	CASE Category
Karr, G. R.	HQ-XE/McGee, A. S.	49-Engr, NEC
	HQ-XE/Schwartz, E. T.	

NAG 5-1188 University of Alabama - University 1191
 IPC two-color analysis of X-ray galaxy clusters

Period	Obligations	
08/01/89-07/31/90	FY89: \$20,000	TOTAL: \$20,000
Prin. Invest.	NASA Tech. Officer	CASE Category
White, R. E.	GSFC/West, D.	11-Astronomy

NAG 5-1283 University of Alabama - University 1192
 Comparison of nearby and very-high-redshift radio galaxies

Period	Obligations	
10/01/89-09/30/90	FY89: \$10,099	TOTAL: \$10,099
Prin. Invest.	NASA Tech. Officer	CASE Category
Keel, W. C.	GSFC/West, D.	11-Astronomy

NAG 8-70 University of Alabama - University 1193
 The influence of gravity on the solidification of ceramic metal matrix composite materials

Period	Obligations	
07/30/86-11/26/89	FY89:	TOTAL: \$80,607
Prin. Invest.	NASA Tech. Officer	CASE Category
Stefanesai, D. M.	MSFC/Curreri, P. A.	47-Materials Engr
	MSFC/Lehocky, S. L.	

NAG 8-81 University of Alabama - University 1194
 Stochastic model of the NASA MSFC ground facility for large space structures with uncertain parameters the maximum entropy approach

Period	Obligations	
10/20/86-11/22/89	FY89:	TOTAL: \$40,166
Prin. Invest.	NASA Tech. Officer	CASE Category
Hsia, W. S.	MSFC/Waites, H.	41-Aero Engr
	MSFC/Sharkey, J.	

NAG 8-93 University of Alabama - University 1195
 Computer architecture and intelligent systems for real time Fault tolerant applications advanced guidance control and avionics systems

Period	Obligations	
07/01/87-09/25/90	FY89: \$26,100	TOTAL: \$140,100
Prin. Invest.	NASA Tech. Officer	CASE Category
Carroll, C. C.	MSFC/Haley, A. D.	22-Computer Science
	MSFC/Spears, L.	

NAG 8-123 University of Alabama - University 1196
 Summer faculty fellowship research continuation program

Period	Obligations	
12/12/88-11/20/90	FY89: \$214,972	TOTAL: \$214,972
Prin. Invest.	NASA Tech. Officer	CASE Category
Freeman, M.	MSFC/Six, F.	99-Multi-Discip
Irwin, R. D.	MSFC/Chappel, C.	
Springer, W. T.		

NAG 8-703 University of Alabama - University 1197
 Program risk methodology development and demonstration

Period	Obligations	
03/01/88-10/31/88	FY89:	TOTAL: \$14,933
Prin. Invest.	NASA Tech. Officer	CASE Category
Baton, R. G.	MSFC/Patel, S.	29-Math/Computer, NEC

NAG 8-718 University of Alabama - University 1198
 Development of generalized solution strategy for commonality studies

Period	Obligations	
05/15/88-08/29/89	FY89:	TOTAL: \$58,579
Prin. Invest.	NASA Tech. Officer	CASE Category
Yeager, D. P.	MSFC/Thomas, L. D.	22-Computer Science
	MSFC/Sisk, S. M.	

NCC 8-3 University of Alabama - University 1199
 Influence of a gravity level during solidification processing on the superconducting transition temperature of TB-SE-SN alloys

Period	Obligations	
07/14/87-08/28/89	FY89:	TOTAL: \$40,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Stefanescu, D. M.	MSFC/Curreri, T. A.	49-Engr, NEC
	MSFC/Strauss, E. M.	

NGT 01-002-099 University of Alabama - University 1200
 Summer faculty fellowship program in research

Period	Obligations	
01/01/78-12/31/89	FY89: \$2,400	TOTAL: \$1,848,027
Prin. Invest.	NASA Tech. Officer	CASE Category
Freeman, L. M.	HQ-LE/Owens, F. C.	49-Engr, NEC

ALASKA

NAG 5-887 University of Alaska - Fairbanks 1201
 Measurements on the snow of interior and arctic Alaska

Period	Obligations	
04/01/87-09/30/90	FY89: \$7,055	TOTAL: \$51,555
Prin. Invest.	NASA Tech. Officer	CASE Category
Benson, C. S.	GSFC/Hall, D. K.	19-Phys Sci, NEC
	GSFC/Foster, J. L.	

NAG 5-1074 University of Alaska - Fairbanks 1202
 Barium injection experiments color TV camera

Period	Obligations	
10/01/88-09/30/89	FY89: \$15,000	TOTAL: \$37,623
Prin. Invest.	NASA Tech. Officer	CASE Category
Hallinan, T. J.	GSFC/Ledley, B. G.	13-Physics
	GSFC/Heppner, J. P.	

NAG 5-1097 University of Alaska - Fairbanks 1203
 Modeling of the atmosphere magnetosphere ionosphere system MAMI

Period	Obligations	
11/01/88-10/31/89	FY89: \$115,000	TOTAL: \$115,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Rees, M. H.	GSFC/Curtis, S. A.	13-Physics
	GSFC/Acuna, M. H.	

NASA'S UNIVERSITY PROGRAM
ALASKA (Continued)

NAG 6-1 University of Alaska - Fairbanks 1204
 Fluorescent plasma tracer and perturbation experiments from sounding rockets
Period *Obligations*
 01/01/80-01/31/90 FY89: \$196,198 TOTAL: \$1,753,747
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Wescott, E. M. GSFC/Early, L. J. 19-Phys Sci, NEC
 GSFC/Pless, R. H.

NAGW 269 University of Alaska - Fairbanks 1205
 Numerical simulation of the turbulent cascade and voltage amplification mechanism in the magnetosphere
Period *Obligations*
 01/01/82-05/31/89 FY89: TOTAL: \$233,415
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Swift, D. W. HQ-ES/Mellott, M. M. 19-Phys Sci, NEC
 HQ-EE/Eastman, T. E.

NAGW 841 University of Alaska - Fairbanks 1206
 Geochemical and kinetic studies on microbial aerobic oxidation a modulator of atmospheric methane fluxes from tundra and marine environments
Period *Obligations*
 10/01/85-06/30/89 FY89: \$33,608 TOTAL: \$455,960
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Reeburgh, W. S. HQ-EE/Kurylo, M. J. 39-Env Sci, NEC
 HQ-EE/Watson, R. T.

NAGW 906 University of Alaska - Fairbanks 1207
 Quasi parallel collisionless shocks
Period *Obligations*
 07/01/86-09/30/89 FY89: \$31,000 TOTAL: \$83,246
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Kan, J. R. HQ-ES/Mellott, M. M. 13-Physics
 HQ-ES/Perry, T. W.

NAGW 932 University of Alaska - Fairbanks 1208
 SAR studies of sea ice in the arctic
Period *Obligations*
 06/01/86-04/30/88 FY89: TOTAL: \$1,303,139
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Weller, G. HQ-EE/Jezek, K. C. 33-Oceanography
 Stringer, W. HQ-EE/Wilson, W. S.

NAGW 1051 University of Alaska - Fairbanks 1209
 The Alaskan SAR facility and studies related to the polar ocean
Period *Obligations*
 03/15/87-03/14/88 FY89: TOTAL: \$110,940
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Weeks, W. F. HQ-EE/Jezek, K. C. 33-Oceanography
 HQ-EE/Wilson, W. S.

NAGW 1174 University of Alaska - Fairbanks 1210
 An investigation of mesoscales variability using aircraft and MST radar data
Period *Obligations*
 10/01/87-09/30/90 FY89: TOTAL: \$129,849
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Fritts, D. C. HQ-EE/Miller, T. L. 31-Atmos Sci
 Nastrom, G. D. HQ-EE/Prather, M. J.

NAGW 1249 University of Alaska - Fairbanks 1211
 A theoretical study of field aligned currents
Period *Obligations*
 01/01/88-12/31/88 FY89: \$3,000 TOTAL: \$3,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Kan, J. R. HQ-EE/Mellott, M. M. 13-Physics
 HQ-EE/Eastman, T. E.

NAGW 1250 University of Alaska - Fairbanks 1212
 Magnetosphere ionosphere coupling and substorm phenomena
Period *Obligations*
 09/01/87-08/31/88 FY89: TOTAL: \$6,258
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Kan, J. R. HQ-EE/Mellott, M. M. 13-Physics

NAGW 1342 University of Alaska - Fairbanks 1213
 Development of solar terrestrial research programs for the nineties
Period *Obligations*
 06/01/88-05/31/90 FY89: \$59,479 TOTAL: \$84,479
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Roederer, J. G. HQ-ES/Mellott, M. M. 13-Physics
 HQ-ES/Perry, T. W.

NAGW 1520 University of Alaska - Fairbanks 1214
 Solar magnetospheric relationship
Period *Obligations*
 02/01/89-01/31/90 FY89: \$36,416 TOTAL: \$36,416
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Akasofu, S. I. HQ-ES/Mellott, M. M. 13-Physics
 HQ-ES/Jones, W. V.

NAGW 1573 University of Alaska - Fairbanks 1215
 Auroral investigations using satellite measurements and modeling
Period *Obligations*
 03/01/89-02/28/90 FY89: \$60,000 TOTAL: \$60,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Rees, M. H. HQ-ES/Mellott, M. M. 11-Astronomy
 HQ-ES/Perry, T. W.

NAGW 1787 University of Alaska - Fairbanks 1216
 Numerical modeling of substorm processes
Period *Obligations*
 06/01/89-05/31/90 FY89: \$55,049 TOTAL: \$55,049
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Swift, D. W. HQ-ES/Mellott, M. M. 13-Physics
 HQ-ES/Perry, T. W.

NAS 5-28762 University of Alaska - Fairbanks 1217
 Coastal and Alaskan gyre circulation as redetermined by thematic mapper data
Period *Obligations*
 08/06/85-12/05/88 FY89: TOTAL: \$203,049
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Royer, T. C. GSFC/Oseroff, H. 33-Oceanography
 GSFC/Stuart, L.

NAS 5-28769 University of Alaska - Fairbanks 1218
 Investigation of LANDSAT data on influence of the Yukon river and on the Bering sea
Period *Obligations*
 08/06/85-06/30/88 FY89: TOTAL: \$149,663
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 McRoy, C. GSFC/Oseroff, H. 19-Phys Sci, NEC

NASA'S UNIVERSITY PROGRAM

ALASKA (Continued)

NAS 5-28971 University of Alaska - Fairbanks 1219
 Operation and maintenance of the Poker Flat research range
Period Obligations
 11/01/85-10/31/89 FY89: \$1,439,390 TOTAL: \$5,305,427
Prin. Invest. NASA Tech. Officer CASE Category
 Brown, N. B. GSFC/Milliner, C. F. 31-Atmos Sci
 GSFC/Brence, W. A.

NAS 8-36321 University of Alaska - Fairbanks 1220
 CBS (Ca, Ba, Sr) plasma experiments from CRRES
Period Obligations
 04/12/85-03/30/90 FY89: \$129,000 TOTAL: \$398,000
Prin. Invest. NASA Tech. Officer CASE Category
 Wescott, E. M. MSFC/Malone, M. F. 31-Atmos Sci

NAS 8-37591 University of Alaska - Fairbanks 1221
 Hf radar studies of mesospheric wind and density fluctuations in Hawaii
Period Obligations
 06/16/89-06/15/92 FY89: \$200,000 TOTAL: \$200,000
Prin. Invest. NASA Tech. Officer CASE Category
 Fritts, D. C. MSFC/Johnson, D. L. 31-Atmos Sci

NCA 5-112 University of Alaska - Fairbanks 1222
 Processing synthetic aperture radar data
Period Obligations
 04/27/88-11/30/89 FY89: \$985,592 TOTAL: \$1,878,187
Prin. Invest. NASA Tech. Officer CASE Category
 Miller, J. GSFC/Trofford, G. H. 11-Astronomy
 Weeks, W. F.
 Weller, G.

NGT 00-050-534 University of Alaska - Fairbanks 1223
 NASA graduate student researchers program
Period Obligations
 07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
 Weeks, W. F. HQ-XE/Owens, F. C. 13-Physics

NSG 7447 University of Alaska - Fairbanks 1224
 Study of the relationship between the ring current and magnetospheric substorms: Study of possible relationship of sudden stratospheric warmings with magnetospheric substorms
Period Obligations
 06/01/78-05/31/88 FY89: TOTAL: \$425,489
Prin. Invest. NASA Tech. Officer CASE Category
 Akasofu, S. I. HQ-EE/Vinas, A. F. 19-Phys Sci, NEC
 HQ-EE/Eastman, T. E.

ARIZONA

NAG 1-562 Arizona State University 1225
 Electromagnetic backscattering by corner reflectors
Period Obligations
 02/01/85-01/31/90 FY89: \$99,997 TOTAL: \$363,122
Prin. Invest. NASA Tech. Officer CASE Category
 Balanis, C. A. LARC/Gilreath, M. C. 45-Elec Engr

NAG 1-805 Arizona State University 1226
 Boundary layer stability on a swept wing
Period Obligations
 08/16/87-06/30/89 FY89: TOTAL: \$61,741
Prin. Invest. NASA Tech. Officer CASE Category
 Saric, W. S. LARC/Maddalon, D. V. 41-Aero Engr
 LARC/Bartlett, D. W.

NAG 1-874 Arizona State University 1227
 Navier-Stokes simulation of the crossflow instability in swept-wing flows
Period Obligations
 04/05/88-10/04/89 FY89: TOTAL: \$50,000
Prin. Invest. NASA Tech. Officer CASE Category
 Reed, H. L. LARC/Maddalon, D. V. 41-Aero Engr
 LARC/Hefner, J. N.

NAG 1-937 Arizona State University 1228
 Transition studies on a swept-wing model
Period Obligations
 01/06/89-01/05/90 FY89: \$89,875 TOTAL: \$89,875
Prin. Invest. NASA Tech. Officer CASE Category
 Saric, W. S. LARC/Dagenhart, J. R. 41-Aero Engr

NAG 1-1032 Arizona State University 1229
 Boundary layer stability in laminar flow control
Period Obligations
 06/15/89-12/31/89 FY89: \$44,977 TOTAL: \$44,977
Prin. Invest. NASA Tech. Officer CASE Category
 Saric, W. S. LARC/Maddalon, D. V. 46-Mech Engr
 LARC/Bartlett, D. W.

NAG 2-522 Arizona State University 1230
 Geophysical analysis of tellus regio Venus
Period Obligations
 05/01/88-04/30/90 FY89: \$36,500 TOTAL: \$73,000
Prin. Invest. NASA Tech. Officer CASE Category
 Williams, D. R. ARC/Lasher, L. E. 11-Astronomy
 ARC/Fimmel, R. O.

NAG 3-383 Arizona State University 1231
 NASA-Arizona State University internship program
Period Obligations
 01/03/83-12/31/88 FY89: TOTAL: \$135,529
Prin. Invest. NASA Tech. Officer CASE Category
 Wang, E. Y. LERC/Brinker, D. J. 45-Elec Engr
 LERC/Flood, D. J.

NAG 3-568 Arizona State University 1232
 Energy stability of thermocapillary convection in models of the float-zone process
Period Obligations
 08/05/84-02/15/89 FY89: TOTAL: \$294,750
Prin. Invest. NASA Tech. Officer CASE Category
 Neitzel, G. P. LERC/Chai, A. 49-Engr, NEC
 Jankowski, D. F. LERC/Salzman, J. A.

NAG 3-580 Arizona State University 1233
 Optimal design of multi-shaft rotor systems
Period Obligations
 12/31/84-09/30/89 FY89: TOTAL: \$180,675
Prin. Invest. NASA Tech. Officer CASE Category
 Nelson, H. D. LERC/Fleming, D. P. 46-Mech Engr
 Castelazo, I. A. LERC/Kascak, A. F.
 Nataraj, C.

NASA'S UNIVERSITY PROGRAM
ARIZONA (Continued)

NAG 3-623 Arizona State University 1234
 Modelling and measurement of heat transfer on turbine blade tip
Period Obligations
 02/28/85-08/25/88 FY89: TOTAL: \$193,603
Prin. Invest. NASA Tech. Officer CASE Category
 Metzger, D. E. LERC/Simon, F. F. 46-Mech Engr
 Chyu, M.

NAG 3-650 Arizona State University 1235
 Fabrication and characterization of high efficiency solar cells for space application
Period Obligations
 08/05/85-11/29/89 FY89: \$40,000 TOTAL: \$290,000
Prin. Invest. NASA Tech. Officer CASE Category
 Shen, C. C. LERC/Wenberg, I. 45-Elec Engr
 LERC/Flood, D.

NAG 3-998 Arizona State University 1236
 Cooperative control theory with application to flight propulsion control
Period Obligations
 02/01/89-01/31/90 FY89: \$59,999 TOTAL: \$59,999
Prin. Invest. NASA Tech. Officer CASE Category
 Schmidt, D. K. LERC/Bullard, R. E. 41-Aero Engr

NAG 3-1054 Arizona State University 1237
 Stability and instability of thermocapillary convection in models of the float zone process
Period Obligations
 06/13/89-11/12/89 FY89: \$60,000 TOTAL: \$60,000
Prin. Invest. NASA Tech. Officer CASE Category
 Neitzel, G. P. LERC/Salzman, J. A. 46-Mech Engr
 Jankowski, D. F.

NAG 5-481 Arizona State University 1238
 Ultraviolet observations of galactic novae in outburst
Period Obligations
 10/01/84-09/30/90 FY89: \$38,000 TOTAL: \$104,800
Prin. Invest. NASA Tech. Officer CASE Category
 Holberg, J. B. GSFC/West, D. K. 11-Astronomy
 Kenyon, S.
 Ferland, G.

NAG 5-547 Arizona State University 1239
 K giant spectra for stellar population models
Period Obligations
 06/01/85-09/14/90 FY89: TOTAL: \$68,970
Prin. Invest. NASA Tech. Officer CASE Category
 Burstein, D. GSFC/Kondo, Y. 11-Astronomy
 Wu, C. C.
 O'Connell, R. W.

NAG 5-996 Arizona State University 1240
 Probing the voids
Period Obligations
 09/01/87-08/31/90 FY89: \$26,100 TOTAL: \$53,455
Prin. Invest. NASA Tech. Officer CASE Category
 Cowley, A. P. GSFC/West, D. K. 11-Astronomy
 Hartwick, F. D.

NAG 5-1006 Arizona State University 1241
 Blue stragglers in open clusters
Period Obligations
 10/01/87-09/30/89 FY89: TOTAL: \$30,756
Prin. Invest. NASA Tech. Officer CASE Category
 Stryker, L. GSFC/Kondo, Y. 11-Astronomy
 Garmany, C.

NAG 5-1159 Arizona State University 1242
 An Atlas of the early ultraviolet spectra of novae
Period Obligations
 07/15/89-07/14/90 FY89: \$27,962 TOTAL: \$27,962
Prin. Invest. NASA Tech. Officer CASE Category
 Stryker, L. L. GSFC/West, D. 11-Astronomy

NAG 5-1172 Arizona State University 1243
 Comparison of nearby and very-high-redshift radio galaxies
Period Obligations
 07/15/89-07/14/90 FY89: \$10,900 TOTAL: \$10,900
Prin. Invest. NASA Tech. Officer CASE Category
 Windhorst, R. A. GSFC/West, D. K. 11-Astronomy

NAG 8-576 Arizona State University 1244
 Optical studies of accreting galactic clusters observed with HEAO-2
Period Obligations
 04/01/86-04/01/88 FY89: TOTAL: \$11,134
Prin. Invest. NASA Tech. Officer CASE Category
 Romanishin, W. MSFC/Dorries, A. M. 11-Astronomy

NAG 8-665 Arizona State University 1245
 The X ray properties of UGC and ESO galaxies in Einstein fields
Period Obligations
 08/01/86-01/31/89 FY89: TOTAL: \$14,108
Prin. Invest. NASA Tech. Officer CASE Category
 Burstein, D. MSFC/Harper, B. A. 11-Astronomy

NAG 8-734 Arizona State University 1246
 The X ray properties of normal galaxies in Einstein fields
Period Obligations
 10/01/88-09/30/90 FY89: TOTAL: \$15,054
Prin. Invest. NASA Tech. Officer CASE Category
 Burstein, D. MSFC/Harper, B. A. 11-Astronomy

NAG 8-756 Arizona State University 1247
 X ray variability of the black hole candidate LMC x
Period Obligations
 01/02/89-12/31/90 FY89: \$50,258 TOTAL: \$50,258
Prin. Invest. NASA Tech. Officer CASE Category
 Cowley, A. P. MSFC/Harvisik, D. 11-Astronomy

NAG 9-59 Arizona State University 1248
 Mineralogy of carbonaceous chondrites and cosmic dust particles
Period Obligations
 02/15/83-02/15/90 FY89: \$102,000 TOTAL: \$629,000
Prin. Invest. NASA Tech. Officer CASE Category
 Buseck, P. R. JSC/Brown, I. D. 32-Geological Sci
 Tomeoka, K.

NAG 9-79 Arizona State University 1249
 Meteorites the origin and early evolution of the solar
Period Obligations
 03/01/84-04/01/89 FY89: TOTAL: \$259,653
Prin. Invest. NASA Tech. Officer CASE Category
 Larimer, J. W. JSC/Browne, I. D. 32-Geological Sci

NAG 9-183 Arizona State University 1250
 Curate investigate characterize and describe meteorites
Period Obligations
 10/01/86-10/01/90 FY89: \$10,000 TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
 Moore, C. B. JSC/Browne, I. D. 32-Geological Sci

**NASA'S UNIVERSITY PROGRAM
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NAG 9-237	Arizona State University	1251	NAGW 1115	Arizona State University	1259
Volatiles in primary Martian magmas			Continued research ignimbrites Earth and Mars		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
06/01/87-12/01/88	FY89: TOTAL: \$55,000		06/01/87-01/31/90	FY89: TOTAL: \$44,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Holloway, J. R.	JSC/Browne, I. D.	32-Geological Sci	Sheridan, M. F.	HQ-EL/Underwood, J. R. HQ-EL/Boyce, J. M.	32-Geological Sci
NAGW 1	Arizona State University	1252	NAGW 1224	Arizona State University	1260
Planetary and Mars geomorphology			Geologic mapping of southern Mangala Valles MTME 15147		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
02/01/80-09/30/89	FY89: \$50,000 TOTAL: \$735,232		10/01/87-06/30/90	FY89: \$3,183 TOTAL: \$13,743	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Malin, M. C.	HQ-EL/Underwood, J. HQ-EL/Boyce, J. M.	32-Geological Sci	Greeley, R.	HQ-EL/Underwood, J. HQ-EL/Boyce, J. M.	32-Geological Sci
NAGW 132	Arizona State University	1253	NAGW 1306	Arizona State University	1261
Geological studies of the Galilean satellite			Mapping planetary and satellite surface		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
02/01/81-01/31/90	FY89: \$46,700 TOTAL: \$693,977		10/01/87-12/31/89	FY89: \$41,000 TOTAL: \$79,562	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Greeley, R.	HQ-EL/Underwood, J. HQ-EL/Boyce, J. M.	32-Geological Sci	Greeley, R.	HQ-EL/Boyce, J. M. HQ-EL/Scott, D. H.	32-Geological Sci
NAGW 529	Arizona State University	1254	NAGW 1343	Arizona State University	1262
Field measurements of the 1983 east rift basalt flows at Kilauea volcano			Rheology and composition of Martian mass movement deposits		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
03/01/84-12/31/89	FY89: \$13,800 TOTAL: \$72,960		02/01/88-01/31/91	FY89: \$6,700 TOTAL: \$16,700	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Fink, J.	HQ-EL/Underwood, J. R. HQ-EC/Boyce, J. M.	32-Geological Sci	Fink, J.	HQ-EL/Underwood, J. R.	32-Geological Sci
NAGW 547	Arizona State University	1255	NAGW 1395	Arizona State University	1263
Spectroscopy of comets			Evolution of photosynthesis		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
02/15/84-11/30/90	FY89: \$132,991 TOTAL: \$459,927		07/01/88-06/30/90	FY89: \$56,499 TOTAL: \$112,421	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Wyckoff, S.	HQ-EL/Brinton, H. C. HQ-EL/Rahe, J. H.	11-Astronomy	Blankenship, R. E.	HQ-EB/Rummel, J. D.	51-Biological Sci
NAGW 943	Arizona State University	1256	NAGW 1429	Arizona State University	1264
Thermal infrared special measurements of geologic materials			Thermal conductivity measurements for planetary surfaces		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
07/15/86-09/30/89	FY89: \$14,600 TOTAL: \$95,470		08/15/88-09/30/89	FY89: \$10,000 TOTAL: \$24,973	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Christensen, P. R.	HQ-EL/Underwood, J. HQ-EL/Boyce, J. M.	32-Geological Sci	Christensen, P. R.	HQ-EL/Underwood, J. R.	32-Geological Sci
NAGW 1074	Arizona State University	1257	NAGW 1456	Arizona State University	1265
Martian volcanism type age and distribution of volcanic materials on Mars			Volatiles in primary Martian magmas		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
06/01/87-05/30/90	FY89: \$35,000 TOTAL: \$104,780		06/01/88-05/31/90	FY89: \$54,997 TOTAL: \$109,997	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Greeley, R.	HQ-EL/Underwood, J. R. HQ-EL/Boyce, J. M.	32-Geological Sci	Holloway, J. R.	HQ-EL/Boyce, J. M.	19-Phys Sci, NEC
NAGW 1080	Arizona State University	1258	NAGW 1654	Arizona State University	1266
Mars surface compositional variations from thermal emissivity and albedo determinations			Comprehensive investigation of HQCDTE metal organic chemical vapor deposition		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
05/01/87-04/30/90	FY89: \$39,949 TOTAL: \$119,797		03/15/89-03/14/90	FY89: \$79,519 TOTAL: \$79,519	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Christensen, P. R.	HQ-EL/Underwood, J. R. HQ-EL/Boyce, J. M.	32-Geological Sci	Raupp, G. B.	HQ-E/Alexander, J. K. HQ-E/Holland, D. A.	47-Materials Engr

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ARIZONA (Continued)

NAGW 1740 Arizona State University 1267
 Fluid dynamics of multiphase flow in volcanic environments on the Earth in and other planets
Period Obligations
 02/01/89-10/31/89 FY89: \$25,000 TOTAL: \$25,000
Prin. Invest NASA Tech. Officer CASE Category
 Kieller, S. W. HQ-EL/Underwood, J. R. 32-Geological Sci

NGT 00-070-100 Arizona State University 1275
 NASA graduate student researchers underrepresented minority focus program
Period Obligations
 10/01/88-09/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest NASA Tech. Officer CASE Category
 Cronin, J. HQ-XE/Owens, F. C. 12-Chemistry

NAGW 1774 Arizona State University 1268
 Geologic mapping of hadriaca patera and tyrrhena patera
Period Obligations
 04/01/89-03/31/90 FY89: \$10,116 TOTAL: \$10,116
Prin. Invest NASA Tech. Officer CASE Category
 Greeley, R. HQ-EL/Underwood, J. R. 32-Geological Sci

NGT 00-070-155 Arizona State University 1276
 NASA graduate student researchers underrepresented minority focus program
Period Obligations
 08/15/89-08/14/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest NASA Tech. Officer CASE Category
 Greeley, R. HQ-XE/Owens, F. C. 32-Geological Sci

NASW 4098 Arizona State University 1269
 Unix microcomputer-based image processing system development for the planetary data system
Period Obligations
 08/16/85-07/14/89 FY89: TOTAL: \$160,357
Prin. Invest NASA Tech. Officer CASE Category
 Anderson, D. L. HQ-EL/Quaide, W. L. 22-Computer Science

NGT 03-001-803 Arizona State University 1277
 NASA graduate student researchers program
Period Obligations
 07/01/85-03/31/89 FY89: TOTAL: \$54,000
Prin. Invest NASA Tech. Officer CASE Category
 Greeley, R. HQ-LE/Owens, F. C. 12-Chemistry

NCA 2-362 Arizona State University 1270
 Formulation of a soil sampling rationale for exobiology Mars missions
Period Obligations
 10/01/88-09/30/90 FY89: \$30,500 TOTAL: \$30,500
Prin. Invest NASA Tech. Officer CASE Category
 Greeley, R. ARC/Carle, G. C. 32-Geological Sci
 Marshall, J. R.

NSG 7255 Arizona State University 1278
 The nature and origin of organic compounds in carbonaceous meteorites
Period Obligations
 06/14/76-09/30/89 FY89: \$95,000 TOTAL: \$843,664
Prin. Invest NASA Tech. Officer CASE Category
 Cronin, J. R. HQ-EB/Rummell, J. D. 32-Geological Sci
 Yuen, G. U. HQ-EB/Averner, M.

NCC 2-346 Arizona State University 1271
 Laboratory simulations of Martian and Venusian Aeolian processes
Period Obligations
 03/01/85-02/28/90 FY89: \$94,986 TOTAL: \$431,575
Prin. Invest NASA Tech. Officer CASE Category
 Greeley, R. ARC/Smith, B. F. 32-Geological Sci
 Marshall, J. HQ-/Pollaef, J. P.

NSG 7415 Arizona State University 1279
 Geological studies in planetology
Period Obligations
 12/01/77-09/30/89 FY89: \$171,500 TOTAL: \$2,608,610
Prin. Invest NASA Tech. Officer CASE Category
 Greeley, R. HQ-EL/Underwood, J. R. 32-Geological Sci
 HQ-EL/Boyce, J. M.

NCC 2-348 Arizona State University 1272
 Space station astrometric telescope facility: Definition and development phase
Period Obligations
 03/01/85-11/30/90 FY89: TOTAL: \$1,356,711
Prin. Invest NASA Tech. Officer CASE Category
 Levey, E. H. ARC/Nishioka, K. 11-Astronomy
 Gaewood, G. D. ARC/Sobeck, C. K.

NSG 7548 Arizona State University 1280
 Studies in Martian geology
Period Obligations
 03/01/79-09/30/89 FY89: \$37,999 TOTAL: \$894,689
Prin. Invest NASA Tech. Officer CASE Category
 Greeley, R. HQ-EL/Underwood, J. R. 31-Atmos Sci
 HQ-EL/Boyce, J. M.

NGT 00-050-301 Arizona State University 1273
 NASA graduate student researchers program
Period Obligations
 08/01/88-07/31/90 FY89: \$17,700 TOTAL: \$35,700
Prin. Invest NASA Tech. Officer CASE Category
 Holloway, J. HQ-XE/Owens, F. C. 32-Geological Sci

NAG 2-465 Northern Arizona University 1281
 A combined analysis of Venusian gravity and surface morphology
Period Obligations
 01/01/87-08/26/88 FY89: TOTAL: \$18,344
Prin. Invest NASA Tech. Officer CASE Category
 Morgan, P. ARC/Fimmel, R. O. 11-Astronomy
 ARC/Craig, R. A.

NGT 00-050-480 Arizona State University 1274
 NASA graduate student researchers program
Period Obligations
 08/15/89-08/14/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest NASA Tech. Officer CASE Category
 Sheridan, M. F. HQ-XE/Owens, F. C. 32-Geological Sci

NAGW 928 Northern Arizona University 1282
 Mars movie project
Period Obligations
 07/01/86-06/31/89 FY89: TOTAL: \$94,200
Prin. Invest NASA Tech. Officer CASE Category
 Mullens, L. J. HQ-EL/Boyce, J. M. 32-Geological Sci
 HQ-EL/French, B. M.

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NAGW 979 Northern Arizona University 1283
Alba patera 1:500,000 scale geologic map
Period Obligations
10/01/86-09/30/89 FY89: \$30,000 TOTAL: \$112,000
Prin. Invest. NASA Tech. Officer CASE Category
Holt, H. E. HQ-EL/Boyce, J. M. 32-Geological Sci
HQ-EL/Underwood, J.R.

NAGW 982 Northern Arizona University 1284
Tempe plateau 1:500,000 scale geologic maps
Period Obligations
10/01/86-09/30/88 FY89: TOTAL: \$59,917
Prin. Invest. NASA Tech. Officer CASE Category
Swann, G. A. HQ-EL/Underwood, J. R. 32-Geological Sci
HQ-EL/French, B. M.

NCA 2-141 Northern Arizona University 1285
Ecosystem response to changes in fertility and moisture
Period Obligations
07/01/86-06/30/88 FY89: TOTAL: \$30,459
Prin. Invest. NASA Tech. Officer CASE Category
Bowman, A. ARC/Matson, P. A. 54-Env Biology

NAG 1-919 University of Arizona 1286
Implementation of the coupled space energy galactic cosmic ray analytical benchmark
Period Obligations
10/16/88-10/15/89 FY89: \$2,152 TOTAL: \$2,152
Prin. Invest. NASA Tech. Officer CASE Category
Ganapol, B. D. LARC/Townsend, L. W. 13-Physics
LARC/Conway, E. J.

NAG 1-1041 University of Arizona 1287
Development of deterministic transport methods for low energy neutrons for shielding in space
Period Obligations
10/01/89-09/30/90 FY89: \$35,000 TOTAL: \$35,000
Prin. Invest. NASA Tech. Officer CASE Category
Ganapol, B. D. LARC/Wilson, J. W. 13-Physics
LARC/Conway, E. J.

NAG 2-143 University of Arizona 1288
Participation in the Pioneer/Venus mission
Period Obligations
10/01/81-10/31/89 FY89: \$60,009 TOTAL: \$416,605
Prin. Invest. NASA Tech. Officer CASE Category
Hunten, D. M. ARC/Lasher, L. E. 19-Phys Sci, NEC
ARC/Craig, R. A.

NAG 2-161 University of Arizona 1289
New techniques of fabricating lightweight glass mirrors
Period Obligations
01/01/82-09/30/89 FY89: TOTAL: \$254,964
Prin. Invest. NASA Tech. Officer CASE Category
Schlosser, H. LERC/Ferrante, J. 11-Astronomy
Woolf, N. J.

NAG 2-206 University of Arizona 1290
Infrared spectroscopy of planetary atmospheres from the Kuiper Airborne Observatory
Period Obligations
11/01/82-12/31/89 FY89: \$195,798 TOTAL: \$1,301,700
Prin. Invest. NASA Tech. Officer CASE Category
Larson, H. P. ARC/Haughney, L. C. 11-Astronomy
Davis, D. S.
Black, J. H.

NAG 2-319 University of Arizona 1291
Definition of the science requirements for SIRTf
Period Obligations
07/01/84-12/31/89 FY89: \$30,000 TOTAL: \$190,393
Prin. Invest. NASA Tech. Officer CASE Category
Low, F. J. ARC/Ramos, R. 11-Astronomy
ARC/Thorley, G.

NAG 2-320 University of Arizona 1292
Definition phase of a multiband imaging photometer MIPS for the space infrared telescope facility (SIRTf)
Period Obligations
09/01/84-10/31/89 FY89: TOTAL: \$832,005
Prin. Invest. NASA Tech. Officer CASE Category
Rieke, G. ARC/Ramos, R. 11-Astronomy
ARC/Thorley, G.

NAG 2-384 University of Arizona 1293
Skeletal muscle metabolism in hypokinetic rats
Period Obligations
11/01/85-11/30/89 FY89: \$60,531 TOTAL: \$216,109
Prin. Invest. NASA Tech. Officer CASE Category
Tischler, M. E. ARC/Winget, C. M. 51-Biological Sci
ARC/Ballard, R. W.

NAG 2-392 University of Arizona 1294
Mechanistic studies on reduced exercise performance and cardiac deconditioning with simulated zero gravity
Period Obligations
04/15/86-06/30/89 FY89: \$97,000 TOTAL: \$364,016
Prin. Invest. NASA Tech. Officer CASE Category
Tipton, C. M. ARC/Hargers, A. R. 59-Life Sci, NEC
Overton, J. M.

NAG 2-416 University of Arizona 1295
The net flux of radiation in the atmosphere of Jupiter
Period Obligations
08/01/86-12/31/89 FY89: \$30,000 TOTAL: \$116,318
Prin. Invest. NASA Tech. Officer CASE Category
Tomasko, M. G. ARC/Twarowski, R. J. 31-Atmos Sci
ARC/Chin, B.

NAG 2-447 University of Arizona 1296
Hot extended emission in the infrared background infrared Cirrus asteroid dust bands and cometary dust trails
Period Obligations
03/01/87-08/31/89 FY89: TOTAL: \$20,000
Prin. Invest. NASA Tech. Officer CASE Category
Low, F. J. ARC/Goorvitch, D. 11-Astronomy
Sykes, M. V.

NAG 2-519 University of Arizona 1297
Solar cycle variation of the Venus ionosphere thermosphere
Period Obligations
07/01/88-06/30/90 FY89: \$40,000 TOTAL: \$79,997
Prin. Invest. NASA Tech. Officer CASE Category
Bougher, S. W. ARC/Lasher, L. E. 11-Astronomy
ARC/Fimmel, R. O.

NAG 2-527 University of Arizona 1298
Refinement of ground-based imaging and photometry of the Saturn E-ring for the proposed NASA-ESA Cassini mission
Period Obligations
02/01/88-01/31/89 FY89: TOTAL: \$9,000
Prin. Invest. NASA Tech. Officer CASE Category
Larson, S. M. ARC/Cuzzi, J. N. 11-Astronomy

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NAG 2-533 University of Arizona 1299
 Knowledge base aquisition using group support software
Period Obligations
 04/01/88-11/01/89 FY89: \$165,000 TOTAL: \$445,000
Prin. Invest. NASA Tech. Officer CASE Category
 Nunamaker, J. F. ARC/Friedland, P. E. 22-Computer Science

NAG 2-576 University of Arizona 1300
 The Saturn dust environment from the analysis of energetic charged particle measurements
Period Obligations
 01/01/89-12/31/89 FY89: \$10,071 TOTAL: \$10,071
Prin. Invest. NASA Tech. Officer CASE Category
 Hood, L. L. ARC/Cuzzi, J. N. 11-Astronomy

NAG 3-357 University of Arizona 1301
 Noise generated by airfoils encountering high frequency convected disturbances-effects of airfoil shape, incidence angle and finite span sweep
Period Obligations
 11/30/82-01/04/90 FY89: \$60,000 TOTAL: \$361,188
Prin. Invest. NASA Tech. Officer CASE Category
 Kerschen, E. J. LERC/Groeneweg, J. F. 41-Aero Engr

NAG 3-392 University of Arizona 1302
 The optics of surface plasmas polaritions
Period Obligations
 01/25/83-09/30/87 FY89: TOTAL: \$286,188
Prin. Invest. NASA Tech. Officer CASE Category
 Stegeman, G. I. LERC/Arrison, A. 13-Physics
 Burke, J. J.
 Gibson, U. J.

NAG 3-460 University of Arizona 1303
 The origin and control of large coherent structures in an axisymmetric turbulent jet
Period Obligations
 11/15/83-01/31/88 FY89: TOTAL: \$150,000
Prin. Invest. NASA Tech. Officer CASE Category
 Peterson, R. A. LERC/Miles, J. 41-Aero Engr
 Wygnanski, I. J.

NAG 3-714 University of Arizona 1304
 Identification of hi-performance system and component technology for unmanned satellite electrical power systems for use beyond the year 2000
Period Obligations
 05/16/86-12/15/88 FY89: TOTAL: \$114,487
Prin. Invest. NASA Tech. Officer CASE Category
 Maisel, J. LERC/Myers, I. T. 42-Astro Engr

NAG 3-723 University of Arizona 1305
 Role of gravity on macro segregation in alloys
Period Obligations
 05/09/86-08/01/89 FY89: TOTAL: \$452,514
Prin. Invest. NASA Tech. Officer CASE Category
 Poirier, D. R. LERC/Chait, A. 47-Materials Engr
 Chen, C. F.
 Heinrich, J. C.

NAG 3-781 University of Arizona 1306
 Nonlinear evolution of coherent structures in supersonic shear layers
Period Obligations
 02/08/87-03/06/90 FY89: TOTAL: \$42,864
Prin. Invest. NASA Tech. Officer CASE Category
 Balsa, T. LERC/Miles, J. H. 41-Aero Engr
 LERC/Rice, E.

NAG 5-38 University of Arizona 1307
 Study of the hottest white dwarfs from the Palomar-Green study
Period Obligations
 04/01/80-09/30/88 FY89: TOTAL: \$162,119
Prin. Invest. NASA Tech. Officer CASE Category
 Green, R. GSFC/Kondo, Y. 11-Astronomy
 Schmidt, M.
 Bechtold, J.

NAG 5-326 University of Arizona 1308
 Deformation within and between lithospheric plates: A finite element analysis
Period Obligations
 06/01/83-10/31/88 FY89: TOTAL: \$96,635
Prin. Invest. NASA Tech. Officer CASE Category
 Richardson, R. M. GSFC/Welker, J. 32-Geological Sci

NAG 5-434 University of Arizona 1309
 IUE observations of Saturn's rings white dwarf lyman alpha profiles
Period Obligations
 07/01/84-08/31/90 FY89: \$20,000 TOTAL: \$168,600
Prin. Invest. NASA Tech. Officer CASE Category
 Holbert, J. B. GSFC/Kondo, Y. 11-Astronomy
 Sion, E. M.

NAG 5-441 University of Arizona 1310
 A study of strongly magnetic variable white dwarfs
Period Obligations
 07/15/84-08/31/89 FY89: TOTAL: \$154,223
Prin. Invest. NASA Tech. Officer CASE Category
 Polidan, R. S. GSFC/Kondo, Y. 11-Astronomy
 Peters, G. J.
 Carone, T. E.

NAG 5-444 University of Arizona 1311
 Geoid as an indicator of large scale mantle connection and the proper motion of hot spots
Period Obligations
 07/15/84-12/31/89 FY89: \$39,004 TOTAL: \$160,090
Prin. Invest. NASA Tech. Officer CASE Category
 Chase, C. G. GSFC/Welker, J. E. 32-Geological Sci

NAG 5-560 University of Arizona 1312
 Observations of hydrogen emission from Jupiter
Period Obligations
 06/01/85-09/30/90 FY89: \$37,900 TOTAL: \$150,200
Prin. Invest. NASA Tech. Officer CASE Category
 Shemansky, D. GSFC/West, D. 11-Astronomy
 Holberg, J. B.

NAG 5-625 University of Arizona 1313
 In situ investigation of the neutral population between 200 and 1500 km altitude
Period Obligations
 04/15/84-01/31/90 FY89: TOTAL: \$323,880
Prin. Invest. NASA Tech. Officer CASE Category
 Ksieh, K. C. GSFC/Early, L. J. 13-Physics
 Fan, C. Y. GSFC/Pless, R. H.
 Curtis, C. C.

NAG 5-637 University of Arizona 1314
 EUV spectral imager 400 1300A Io Torus and comets
Period Obligations
 07/01/86-06/30/90 FY89: \$152,977 TOTAL: \$302,977
Prin. Invest. NASA Tech. Officer CASE Category
 Broadfoot, A. L. GSFC/Early, L. J. 13-Physics
 GSFC/Pless, R. H.

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ARIZONA (Continued)

NAG 5-703	University of Arizona	1315	The white dwarfs and inner accretion discs of three unusual dwarf novae
<i>Period</i>	<i>Obligations</i>		
09/01/85-08/31/90	FY89: TOTAL: \$18,315		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Wade, R. A.	GSFC/Kondo, Y.	11-Astronomy	
Liebert, J. W.			
NAG 5-790	University of Arizona	1316	Remote sensing gamma ray spectroscopy
<i>Period</i>	<i>Obligations</i>		
07/01/86-07/31/90	FY89: \$23,330 TOTAL: \$57,354		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Boynton, W. V.	GSFC/Trombka, J. I.	11-Astronomy	
NAG 5-831	University of Arizona	1317	Holographic particle detection
<i>Period</i>	<i>Obligations</i>		
08/01/86-11/30/88	FY89: TOTAL: \$29,344		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Bowen, T.	GSFC/Balasubrahmanya, V. K.	13-Physics	
Stark, R. W.	GSFC/Streitmatter, R. E.		
Huffman, D. R.			
NAG 5-859	University of Arizona	1318	The absolute radiometer calibration of the advanced very high resolution radiometer
<i>Period</i>	<i>Obligations</i>		
11/01/86-02/28/89	FY89: TOTAL: \$132,600		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Slater, P. N.	GSFC/Oseoff, H.	19-Phys Sci, NEC	
	GSFC/Hall, F. G.		
NAG 5-861	University of Arizona	1319	Detection of land surface change in arid regions application of a surface structure model in the Sonoran desert
<i>Period</i>	<i>Obligations</i>		
11/15/86-02/14/89	FY89: TOTAL: \$111,500		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hutchinson, C. F.	GSFC/Oseroff, H.	19-Phys Sci, NEC	
NAG 5-879	University of Arizona	1320	Antiprotons in the cosmic rays
<i>Period</i>	<i>Obligations</i>		
02/15/87-04/30/90	FY89: \$55,000 TOTAL: \$136,757		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Bowen, T.	GSFC/Ormes, J. F.	13-Physics	
NAG 5-953	University of Arizona	1321	The nature of the pulsed light in intermediate polars
<i>Period</i>	<i>Obligations</i>		
08/01/87-07/31/89	FY89: TOTAL: \$8,212		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Berriman, G.	GSFC/Kondo, Y.	11-Astronomy	
Schmidt, G.			
NAG 5-965	University of Arizona	1322	Very hot subdwarfs
<i>Period</i>	<i>Obligations</i>		
09/01/87-09/30/90	FY89: \$8,224 TOTAL: \$35,982		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Liebert, J. W.	GSFC/West, D.	11-Astronomy	
Green, R.			
NAG 5-1142	University of Arizona	1323	Multispectral monitoring of a selected Seyfert galaxy Markarian 509
<i>Period</i>	<i>Obligations</i>		
06/15/89-06/14/90	FY89: \$23,800 TOTAL: \$23,800		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Carone, T. E.	GSFC/West, D. K.	11-Astronomy	
NAG 5-1191	University of Arizona	1324	Far ultraviolet variability in active galaxies
<i>Period</i>	<i>Obligations</i>		
08/01/89-07/31/90	FY89: \$33,000 TOTAL: \$33,000		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Carone, T. E.	GSFC/West, D.	11-Astronomy	
NAG 5-1221	University of Arizona	1325	A study of the large-scale infrared emission from a selected dark cloud
<i>Period</i>	<i>Obligations</i>		
08/15/89-08/14/90	FY89: \$31,045 TOTAL: \$31,045		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Young, E. T.	GSFC/West, D.	11-Astronomy	
NAG 5-1222	University of Arizona	1326	Model analysis of the IUE planetary data
<i>Period</i>	<i>Obligations</i>		
08/15/89-08/14/90	FY89: \$26,000 TOTAL: \$26,000		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Shemansky, D. E.	GSFC/West, D.	11-Astronomy	
NAG 5-1234	University of Arizona	1327	A calibration network for future infrared observations
<i>Period</i>	<i>Obligations</i>		
08/15/89-02/14/90	FY89: \$17,450 TOTAL: \$17,450		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Rieke, G. H.	GSFC/West, D.	11-Astronomy	
NAG 5-1235	University of Arizona	1328	Infrared properties of strong radio sources
<i>Period</i>	<i>Obligations</i>		
08/15/89-02/14/90	FY89: \$19,000 TOTAL: \$19,000		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Impey, C.	GSFC/West, D.	11-Astronomy	
NAG 5-1236	University of Arizona	1329	A study of extended solar system structures and Pluto
<i>Period</i>	<i>Obligations</i>		
08/15/89-02/14/90	FY89: \$21,750 TOTAL: \$21,750		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Sykes, M. V.	GSFC/West, D.	11-Astronomy	
NAG 5-1237	University of Arizona	1330	Star formation/interstellar medium
<i>Period</i>	<i>Obligations</i>		
08/15/89-08/14/90	FY89: \$20,000 TOTAL: \$20,000		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Lada, C. J.	GSFC/West, D.	11-Astronomy	
NAG 5-1252	University of Arizona	1331	A flux limited sample of quasars drawn from the IRAS faint source catalog
<i>Period</i>	<i>Obligations</i>		
09/01/89-02/28/90	FY89: \$26,750 TOTAL: \$26,750		
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Low, F. J.	GSFC/West, D.	11-Astronomy	

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ARIZONA (Continued)

NAG 8-110 University of Arizona 1332
 Theory of auroras on the outer planets
Period Obligations
 04/12/88-05/11/89 FY89: TOTAL: \$26,527
Prin. Invest. NASA Tech. Officer CASE Category
 Sandel, B. R. MSFC/Moore, T. E. 42-Astro Engr
 Yalle, R. MSFC/Fields, S. A.

NAG 9-39 University of Arizona 1340
 Meteoritic basalts
Period Obligations
 02/01/83-02/01/90 FY89: \$145,000 TOTAL: \$736,957
Prin. Invest. NASA Tech. Officer CASE Category
 Drake, M. J. JSC/Browne, I. D. 12-Chemistry

NAG 8-666 University of Arizona 1333
 Analysis of a complete sample of stars from the expanded Einstein medium sensitivity survey
Period Obligations
 08/01/87-07/31/88 FY89: TOTAL: \$16,405
Prin. Invest. NASA Tech. Officer CASE Category
 Liebert, J. MSFC/Harper, B. A. 11-Astronomy
 Fleming, T. A.

NAG 9-135 University of Arizona 1341
 Investigation of hafnium isotopes in Archean sedimentary zircons and terrestrial pre 3.0 ga continental crust
Period Obligations
 04/01/86-04/01/90 FY89: \$36,000 TOTAL: \$138,600
Prin. Invest. NASA Tech. Officer CASE Category
 Patchett, P. J. JSC/Browne, I. D. 32-Geological Sci

NAG 8-667 University of Arizona 1334
 A comparison of X ray and infrared properties of Seyfert 1 galaxies
Period Obligations
 08/01/87-07/31/89 FY89: TOTAL: \$11,365
Prin. Invest. NASA Tech. Officer CASE Category
 Rieke, G. H. MSFC/Harper, B. A. 11-Astronomy
 Lebofsky, M. J.

NAG 9-233 University of Arizona 1342
 Cosmogenic ¹⁴C in meteorites terrestrial rocks
Period Obligations
 06/01/87-06/01/90 FY89: \$33,000 TOTAL: \$96,653
Prin. Invest. NASA Tech. Officer CASE Category
 Jull, A. J. JSC/Browne, I. D. 32-Geological Sci

NAG 8-694 University of Arizona 1335
 Scale up and batch to batch variability problems in solid rocket boosters
Period Obligations
 11/15/87-09/14/88 FY89: TOTAL: \$49,276
Prin. Invest. NASA Tech. Officer CASE Category
 Ramohalli, K. N. MSFC/Frederick, J. 13-Physics
 MSFC/Tumlinson, J. L.

NAG 9-240 University of Arizona 1343
 Noble gas studies of early solar system history
Period Obligations
 06/01/87-06/01/90 FY89: \$50,965 TOTAL: \$78,863
Prin. Invest. NASA Tech. Officer CASE Category
 Swindle, T. D. JSC/Browne, I. D. 32-Geological Sci

NAG 8-716 University of Arizona 1336
 Enhanced hybridoma production using electrofusion under microgravity
Period Obligations
 05/01/88-04/30/89 FY89: TOTAL: \$350,000
Prin. Invest. NASA Tech. Officer CASE Category
 Sammons, D. W. MSFC/Snyder, R. S. 11-Astronomy

NAG 9-259 University of Arizona 1344
 Research in connection with random loading fatigue crack growth
Period Obligations
 10/01/87-01/15/89 FY89: TOTAL: \$16,736
Prin. Invest. NASA Tech. Officer CASE Category
 Ortiz, K. JSC/Goldstein, S. H. 47-Materials Engr

NAG 8-757 University of Arizona 1337
 Quality assurance in solid propellants
Period Obligations
 12/15/88-12/15/90 FY89: \$90,000 TOTAL: \$90,000
Prin. Invest. NASA Tech. Officer CASE Category
 Ramohalli, K. MSFC/Kublin, T. 43-Chem Engr
 MSFC/Tumlinson, J. L.

NAGW 247 University of Arizona 1345
 Cometary spectroscopy
Period Obligations
 11/01/81-10/31/90 FY89: \$43,798 TOTAL: \$320,494
Prin. Invest. NASA Tech. Officer CASE Category
 Larson, S. M. HQ-EL/Brinton, H. C. 11-Astronomy
 HQ-EL/Rahe, J. H.

NAG 8-766 University of Arizona 1338
 Mountain based beta measurements by coherent lidar
Period Obligations
 02/10/89-02/13/90 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. NASA Tech. Officer CASE Category
 Schotland, R. M. MSFC/Fitzjarrald, D. E. 31-Atmos Sci

NAGW 285 University of Arizona 1346
 Hydrogemorphic studies of Mars
Period Obligations
 01/15/82-09/29/89 FY89: \$29,188 TOTAL: \$293,062
Prin. Invest. NASA Tech. Officer CASE Category
 Baker, V. R. HQ-EL/Underwood, J. 32-Geological Sci
 HQ-EL/Boyce, J. M.

NAG 9-37 University of Arizona 1339
 Rare earths and other trace elements in separates from chondrites
Period Obligations
 03/01/83-02/28/90 FY89: \$131,322 TOTAL: \$1,016,422
Prin. Invest. NASA Tech. Officer CASE Category
 Boynton, W. V. JSC/Browne, I. D. 12-Chemistry

NAGW 340 University of Arizona 1347
 Origin and evolution of planetary atmospheres
Period Obligations
 07/01/82-11/30/89 FY89: \$55,393 TOTAL: \$710,650
Prin. Invest. NASA Tech. Officer CASE Category
 Lewis, J. S. HQ-EL/Bergstralh, J. T. 31-Atmos Sci
 HQ-EL/Quaide, W. L.

NASA'S UNIVERSITY PROGRAM **ARIZONA (Continued)**

NAGW 428 Crater modification by gravity <i>Period</i> 04/15/83-09/30/89 <i>Prin. Invest.</i> Melosh, H. J.	University of Arizona 1348 <i>Obligations</i> FY89: \$98,800 <i>NASA Tech. Officer</i> HQ-EL/Underwood, J. R. HQ-EL/Scott, D.	NAGW 693 Establishment of a center for organic separations and pharmaceutical research <i>Period</i> 10/15/84-12/31/89 <i>Prin. Invest.</i> Bier, M.	University of Arizona 1356 <i>Obligations</i> FY89: \$450,000 <i>NASA Tech. Officer</i> HQ-EN/Crouch, R. K. HQ-EN/Lemkey, F. D.
NAGW 500 Venus aeronomy <i>Period</i> 10/01/83-02/28/89 <i>Prin. Invest.</i> Kumar, S.	University of Arizona 1349 <i>Obligations</i> FY89: <i>NASA Tech. Officer</i> HQ-EL/Fox, K. HQ-EL/Quaide, W. L.	NAGW 716 Physical studies of fast-moving asteroids <i>Period</i> 02/01/85-01/31/90 <i>Prin. Invest.</i> Wisniewski, W. Z.	University of Arizona 1357 <i>Obligations</i> FY89: \$38,188 <i>NASA Tech. Officer</i> HQ-EL/Brinton, H. C. HQ-EL/Rahe, J. H.
NAGW 520 Detector evaluation for a deep optical infrared survey <i>Period</i> 02/01/84-01/31/90 <i>Prin. Invest.</i> Rieke, M.	University of Arizona 1350 <i>Obligations</i> FY89: \$450,000 <i>NASA Tech. Officer</i> HQ-EZ/Stachnik, R. V. HQ-EZ/Weiler, E. J.	NAGW 744 A study of the Io plasma torus <i>Period</i> 05/15/85-11/30/89 <i>Prin. Invest.</i> Shemansky, D. E.	University of Arizona 1358 <i>Obligations</i> FY89: \$65,215 <i>NASA Tech. Officer</i> HQ-EL/Bergstrahl, J. HQ-EL/Quaide, W. L.
NAGW 546 Mars ball project <i>Period</i> 03/01/84-08/31/88 <i>Prin. Invest.</i> Hunten, D. M.	University of Arizona 1351 <i>Obligations</i> FY89: <i>NASA Tech. Officer</i> HQ-EL/Quaide, W. L. HQ-EL/Gold, R.	NAGW 763 Formation of stars and stellar systems <i>Period</i> 07/15/85-01/14/90 <i>Prin. Invest.</i> White, S. D.	University of Arizona 1359 <i>Obligations</i> FY89: <i>NASA Tech. Officer</i> HQ-ES/Mellott, M. M. HQ-EZ/Weiler, E. J.
NAGW 587 Stellar observations with the Voyager EUV spectrograph <i>Period</i> 03/01/84-01/31/90 <i>Prin. Invest.</i> Holberg, J.	University of Arizona 1352 <i>Obligations</i> FY89: \$200,500 <i>NASA Tech. Officer</i> HQ-EZ/Clayton, G. C. HQ-EZ/Weiler, E. J.	NAGW 804 The CCD transit instrument deep survey <i>Period</i> 09/01/85-09/30/90 <i>Prin. Invest.</i> McGraw, J. T.	University of Arizona 1360 <i>Obligations</i> FY89: \$90,166 <i>NASA Tech. Officer</i> HQ-EZ/Clayton, G. HQ-EZ/Boggess, N. W.
NAGW 596 Studies of planetary extended atmospheres <i>Period</i> 02/01/84-12/31/90 <i>Prin. Invest.</i> Hunter, D. M.	University of Arizona 1353 <i>Obligations</i> FY89: \$130,001 <i>NASA Tech. Officer</i> HQ-EL/Brinton, H. C. HQ-EL/Rahe, J. H.	NAGW 867 Speckle interferometry of asteroids <i>Period</i> 02/01/86-01/31/88 <i>Prin. Invest.</i> Drummond, J. D.	University of Arizona 1361 <i>Obligations</i> FY89: <i>NASA Tech. Officer</i> HQ-EL/Brinton, H. C. HQ-EL/Bergstrahl, J. T.
NAGW 610 Scientific program in planetary atmospheres studies <i>Period</i> 05/01/84-07/31/90 <i>Prin. Invest.</i> Broadfoot, A. L.	University of Arizona 1354 <i>Obligations</i> FY89: \$116,000 <i>NASA Tech. Officer</i> HQ-EL/Bergstrahl, J. T. HQ-EL/Quaide, W. L.	NAGW 887 Development of CCD scanning for asteroids/comets <i>Period</i> 12/01/85-11/30/90 <i>Prin. Invest.</i> Gehrels, T.	University of Arizona 1362 <i>Obligations</i> FY89: \$10,050 <i>NASA Tech. Officer</i> HQ-EL/Brinton, H. C. HQ-EL/Rahe, J. H.
NAGW 649 Particle excitation airglow and H2 vibrational disequilibrium in the atmosphere of Jupiter <i>Period</i> 09/01/84-01/31/90 <i>Prin. Invest.</i> Shemansky, D. E.	University of Arizona 1355 <i>Obligations</i> FY89: \$60,000 <i>NASA Tech. Officer</i> HQ-EL/Bergstrahl, J. T. HQ-EL/Quaide, W. L.	NAGW 896 Radiometric calibration of the Earth observing systems EOS imaging sensors <i>Period</i> 05/15/86-05/14/90 <i>Prin. Invest.</i> Slater, P.	University of Arizona 1363 <i>Obligations</i> FY89: \$249,936 <i>NASA Tech. Officer</i> HQ-EE/Tuyahov, A. J. HQ-EE/Estes, J. E.

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NAGW 909 University of Arizona 1364
Observations and interpretation of middle atmospheric radiative and photochemical processes
Period *Obligations*
07/01/86-02/28/90 FY89: \$71,032 TOTAL: \$281,365
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hood, L. L. HQ-EE/McPeters, R. D. 31-Atmos Sci
HQ-EE/Prather, M. J.

NAGW 1069 University of Arizona 1372
Development of a molecular and mineralogical analyzer for in situ analysis on a comet
Period *Obligations*
04/01/87-06/30/89 FY89: \$9,549 TOTAL: \$98,549
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Boynton, W. V. HQ-EL/Evans, L. G. 32-Geological Sci
HQ-EL/Quaide, W. L.

NAGW 942 University of Arizona 1365
Measuring absorption coefficients of frozen valuables
Period *Obligations*
07/15/86-01/14/90 FY89: \$15,329 TOTAL: \$52,977
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Fink, U. HQ-EL/Underwood, J. R. 32-Geological Sci
HQ-EL/Boyce, J. M.

NAGW 1073 University of Arizona 1373
Telescience testbed program initiation of testing and evaluation of remote control
Period *Obligations*
05/01/87-01/31/88 FY89: TOTAL: \$98,253
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Schooley, L. C. HQ-E/Schmerling, E. R. 19-Phys Sci, NEC
Triffet, T. HQ-E/Burnett, P.

NAGW 944 University of Arizona 1366
Dynamical evolution of the Galileon satellites
Period *Obligations*
07/01/86-10/31/89 FY89: \$22,931 TOTAL: \$76,936
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Greenberg, R. J. HQ-EL/Underwood, J. R. 32-Geological Sci
HQ-EL/Boyce, J. M.

NAGW 1097 University of Arizona 1374
Development of a cryogenic cosmic dust collector
Period *Obligations*
06/01/87-11/30/88 FY89: TOTAL: \$20,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Fan, C. Y. HQ-EL/Evans, L. G. 13-Physics
HQ-EL/Quaide, W. L.

NAGW 960 University of Arizona 1367
Observational studies of Saturn's rings
Period *Obligations*
07/15/86-10/31/89 FY89: \$34,077 TOTAL: \$102,774
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Porco, C. C. HQ-EL/Underwood, J. R. 32-Geological Sci
HQ-EL/Boyce, J. M.

NAGW 1132 University of Arizona 1375
Planetary astronomy rings satellites and asteroids
Period *Obligations*
01/01/87-12/31/89 FY89: TOTAL: \$60,705
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Greenberg, R. J. HQ-EL/Rahe, J. H. 11-Astronomy

NAGW 962 University of Arizona 1368
Theoretical and observational studies of the interaction of outer planet magnetospheres with satellite and rings
Period *Obligations*
08/01/86-11/30/88 FY89: TOTAL: \$102,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hood, L. L. HQ-EE/Mellot, M. M. 13-Physics
HQ-EE/Eastman, T. E.

NAGW 1146 University of Arizona 1376
Infrared reflectance study of carbonaceous materials
Period *Obligations*
08/01/87-09/30/89 FY89: \$20,129 TOTAL: \$50,060
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lebofsky, L. A. HQ-EL/Underwood, J. R. 32-Geological Sci
HQ-EL/Boyce, J. M.

NAGW 1029 University of Arizona 1369
Planet formation and evolution collisional and dynamical processes
Period *Obligations*
12/01/86-09/30/89 FY89: \$62,476 TOTAL: \$197,476
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Greenberg, R. J. HQ-EL/Underwood, J. R. 32-Geological Sci
HQ-EL/Boyce, J. M.

NAGW 1147 University of Arizona 1377
Meteorites and the early solar system
Period *Obligations*
05/01/87-04/30/89 FY89: TOTAL: \$56,191
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Gehrels, T. HQ-EL/Boyce, J. M. 32-Geological Sci
HQ-EL/Scott, D. H.

NAGW 1039 University of Arizona 1370
Theoretical studies of volatile processes in the atmospheres and surfaces of outer solar system satellites
Period *Obligations*
02/15/87-10/31/89 FY89: \$20,999 TOTAL: \$60,694
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lunine, J. I. HQ-EL/Bergstralh, J. T. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NAGW 1181 University of Arizona 1378
EUV albedo and hydrocarbon photochemistry on Uranus
Period *Obligations*
10/01/87-03/31/90 FY89: \$65,800 TOTAL: \$128,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Yelle, R. V. HQ-EL/Quaide, W. L. 19-Phys Sci, NEC
HQ-EL/Brinton, H. C.

NAGW 1059 University of Arizona 1371
Composition and distribution of Mars surface materials
Period *Obligations*
01/01/87-12/31/89 FY89: \$121,426 TOTAL: \$183,426
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Singer, R. B. HQ-EL/Underwood, J. 32-Geological Sci
HQ-EL/Boyce, J. M.

NAGW 1182 University of Arizona 1379
Model analysis of the particle excited atmosphere of Uranus
Period *Obligations*
10/01/87-09/30/89 FY89: \$84,918 TOTAL: \$162,318
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Shemansky, D. E. HQ-EL/Quaide, W. L. 19-Phys Sci, NEC
HQ-EL/Brinton, H. C.

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NAGW 1184 University of Arizona 1380
 Multiwave length observations of the particles properties of the uranian ring system
Period Obligations
 09/15/87-09/14/90 FY89: \$71,306 TOTAL: \$104,806
Prin. Invest. NASA Tech. Officer CASE Category
 Holberg, J. B. HQ-EL/Quaide, W. L. 11-Astronomy
 HQ-EL/Boyce, J. M.

NAGW 1203 University of Arizona 1381
 An analysis of radial diffusion and obsorption of trapped particles in the inner uranian magnetosphere using CRS and LECP data
Period Obligations
 11/01/87-10/31/90 FY89: \$80,000 TOTAL: \$217,479
Prin. Invest. NASA Tech. Officer CASE Category
 Hood, L. L. HQ-EL/Quaide, W. L. 19-Phys Sci, NEC
 HQ-EL/Parks, G.

NAGW 1207 University of Arizona 1382
 Lyman alpha emissions from Uranus
Period Obligations
 10/01/87-09/30/90 FY89: \$110,203 TOTAL: \$161,303
Prin. Invest. NASA Tech. Officer CASE Category
 Yelle, R. V. HQ-EL/Quaide, W. L. 19-Phys Sci, NEC
 HQ-EL/Brinton, H. C.

NAGW 1208 University of Arizona 1383
 Interpretation of Voyager UVS observations of occultations by the atmosphere of Uranus
Period Obligations
 11/01/87-10/31/90 FY89: \$148,037 TOTAL: \$217,037
Prin. Invest. NASA Tech. Officer CASE Category
 Sandel, B. R. HQ-EL/Quaide, W. L. 19-Phys Sci, NEC
 HQ-EL/Brinton, H. C.

NAGW 1212 University of Arizona 1384
 Cratering chemical and thermal investigation of uranian satellites
Period Obligations
 09/15/87-02/28/90 FY89: \$50,000 TOTAL: \$99,984
Prin. Invest. NASA Tech. Officer CASE Category
 Strom, R. G. HQ-EL/Quaide, W. L. 19-Phys Sci, NEC
 HQ-EL/Underwood, J.

NAGW 1214 University of Arizona 1385
 In the aurora of Uranus
Period Obligations
 10/01/87-09/30/89 FY89: \$40,000 TOTAL: \$90,000
Prin. Invest. NASA Tech. Officer CASE Category
 Sandel, B. R. HQ-EL/Quaide, W. L. 19-Phys Sci, NEC
 HQ-EE/Parks, G.

NAGW 1217 University of Arizona 1386
 Efficient use of multiresolution multispectral remote sensing data in preparation for DOS
Period Obligations
 10/01/87-09/30/89 FY89: \$100,000 TOTAL: \$200,000
Prin. Invest. NASA Tech. Officer CASE Category
 Hutchinson, C. HQ-EE/Tuyahov, A. J. 39-Env Sci, NEC
 Schowengerdt, R. A.

NAGW 1280 University of Arizona 1387
 Descent imager spectral radiometer for the Titan entry of the Cassini mission
Period Obligations
 01/01/88-10/31/89 FY89: \$129,994 TOTAL: \$289,219
Prin. Invest. NASA Tech. Officer CASE Category
 Tomasko, M. HQ-EL/Mahaffy, P. 32-Geological Sci
 HQ-EL/Quaide, W. L.

NAGW 1283 University of Arizona 1388
 The radial velocity search for exresslar planets
Period Obligations
 12/01/87-11/30/89 FY89: \$95,575 TOTAL: \$190,742
Prin. Invest. NASA Tech. Officer CASE Category
 McMillan, R. S. HQ-EL/Brinton, H. C. 11-Astronomy
 HQ-EL/Rahe, J. H.

NAGW 1285 University of Arizona 1389
 Space infrared detector development
Period Obligations
 05/15/88-06/30/90 FY89: \$149,934 TOTAL: \$299,261
Prin. Invest. NASA Tech. Officer CASE Category
 Young, E. HQ-EZ/Gillett, F. C. 11-Astronomy

NAGW 1300 University of Arizona 1390
 Asteroids II
Period Obligations
 04/01/88-05/31/90 FY89: TOTAL: \$54,934
Prin. Invest. NASA Tech. Officer CASE Category
 Gehrels, T. HQ-EL/Brinton, H. C. 11-Astronomy
 HQ-EL/Rahe, J. H.

NAGW 1325 University of Arizona 1391
 Effects of hypogravity or symptogenesis in cell culture
Period Obligations
 04/01/88-03/31/89 FY89: TOTAL: \$45,000
Prin. Invest. NASA Tech. Officer CASE Category
 Gruener, R. P. HQ-EB/Halstead, T. W. 51-Biological Sci

NAGW 1329 University of Arizona 1392
 Analysis of the distribution and optical properties of aerosols in the atmosphere of Uranus using Voyager imaging data
Period Obligations
 04/01/88-09/30/89 FY89: \$83,699 TOTAL: \$162,699
Prin. Invest. NASA Tech. Officer CASE Category
 Tomasko, M. G. HQ-EL/Quaide, W. L. 31-Atmos Sci

NAGW 1332 University of Arizona 1393
 Center for the utilization of local planetary resources
Period Obligations
 06/01/88-02/28/90 FY89: \$1,639,687 TOTAL: \$2,138,777
Prin. Invest. NASA Tech. Officer CASE Category
 Lewis, J. S. HQ-RM/Quigley, B. F. 49-Engr, NEC
 Ramohalli, K. N.

NAGW 1359 University of Arizona 1394
 Monitoring deforrestation in the Guinea highlands using grid and EOS approach
Period Obligations
 07/01/88-12/31/89 FY89: TOTAL: \$50,000
Prin. Invest. NASA Tech. Officer CASE Category
 Hutchinson, C. F. HQ-EE/Miller, T. L. 39-Env Sci, NEC
 HQ-EE/Tuyahov, A. J.

NAGW 1705	University of Arizona	1411
Effects of hypogravty on synaptogenesis in cell culture		
<i>Period</i>	<i>Obligations</i>	
04/01/89-06/30/90	FY89: \$54,405	TOTAL: \$54,405
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Gruener, R. P.	HQ-EB/Halstead, T.	59-Life Sci. NEC

NASA'S UNIVERSITY PROGRAM
ARIZONA (Continued)

NAGW 1720	University of Arizona	1412	Dynamical evolution in the solar
<i>Period</i>	<i>Obligations</i>		
02/01/89-12/15/89	FY89: \$25,000	TOTAL: \$25,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Tittmore, W. A.	HQ-EL/Underwood, J. R.	32-Geological Sci	
NAGW 1725	University of Arizona	1413	Technology development for a balloon-borne telescope for far infrared and submillimeter astronomy
<i>Period</i>	<i>Obligations</i>		
04/01/89-03/31/90	FY89: \$103,751	TOTAL: \$103,751	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hoffman, W. F.	HQ-EZ/Gillett, F. C.	11-Astronomy	
NAGW 1775	University of Arizona	1414	Martian collapse terrains
<i>Period</i>	<i>Obligations</i>		
04/01/89-06/30/90	FY89: \$10,500	TOTAL: \$10,500	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Croft, S. K.	HQ-EL/Underwood, J. R.	32-Geological Sci	
NAGW 1776	University of Arizona	1415	Participation in the Soviet Phobos mission
<i>Period</i>	<i>Obligations</i>		
06/01/89-02/28/90	FY89: \$49,872	TOTAL: \$49,872	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Boynton, W.	HQ-EL/Quaide, W.	11-Astronomy	
NAGW 1820	University of Arizona	1416	Computer hardware for the Voyager UVS astrophysics data program
<i>Period</i>	<i>Obligations</i>		
07/01/89-06/30/90	FY89: \$80,550	TOTAL: \$80,550	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Carone, T. E.	HQ-EZ/Clayton, G.	41-Aero Engr	
NAS 2-12498	University of Arizona	1417	Operation and maintenance of a 15 meter telescope
<i>Period</i>	<i>Obligations</i>		
09/29/86-07/31/90	FY89: \$122,665	TOTAL: \$520,055	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Rieke, M.	ARC/Haughney, L. C.	11-Astronomy	
NAS 2-12578	University of Arizona	1418	Development of multiband IMA photometer for space infrared telescope
<i>Period</i>	<i>Obligations</i>		
03/12/87-03/31/90	FY89: \$938,872	TOTAL: \$2,424,923	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Rieke, G.	ARC/Ramos, R.	11-Astronomy	
NAS 3-25522	University of Arizona	1419	Finish machining antenna reflector
<i>Period</i>	<i>Obligations</i>		
08/12/88-04/01/89	FY89: \$19,970	TOTAL: \$163,132	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Somner, R. E.	LERC/Sharp, G. R.	49-Engr, NEC	
Kettleson, D.			
NAS 5-30008	University of Arizona	1420	The Hubble space telescope near infrared camera and multi-object spectrometer
<i>Period</i>	<i>Obligations</i>		
09/30/86-10/31/89	FY89: \$5,300,000	TOTAL: \$8,840,500	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Thompson, R. I.	GSFC/Sours, W. P.	41-Aero Engr	
	GSFC/Shannon, J. L.		
NAS 5-30124	University of Arizona	1421	Scientific interpretation of GPMS data
<i>Period</i>	<i>Obligations</i>		
09/01/87-09/30/94	FY89:	TOTAL: \$25,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Huntten, D.	GSFC/Niemann, H.	31-Atmos Sci	
NAS 8-32950	University of Arizona	1422	Hormone purification by isoelectric focusing in space
<i>Period</i>	<i>Obligations</i>		
03/29/78-05/31/89	FY89: \$16,622	TOTAL: \$952,893	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Bier, M.	MSFC/Jex, D.	59-Life Sci, NEC	
	MSFC/Barnett, B.		
NAS 8-36278	University of Arizona	1423	Mesoscale structure of the Arizona monsoon
<i>Period</i>	<i>Obligations</i>		
06/11/86-12/31/88	FY89:	TOTAL: \$242,188	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Gall, R. L.	MSFC/Kaufman, J. W.	31-Atmos Sci	
	MSFC/Smith, G. T.		
NAS 8-36477	University of Arizona	1424	Optical studies of lightning
<i>Period</i>	<i>Obligations</i>		
09/26/85-12/31/89	FY89:	TOTAL: \$203,002	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Krider, E. P.	MSFC/Christian, H. J.	13-Physics	
	MSFC/Blakeslee, R.		
NAS 9-16838	University of Arizona	1425	Lymphocyte proliferation in weightlessness
<i>Period</i>	<i>Obligations</i>		
02/23/83-12/01/90	FY89: \$17,000	TOTAL: \$75,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Criswell, B. S.	JSC/Newkirk, K.	59-Life Sci, NEC	
NASW 3627	University of Arizona	1426	Comet Halley neutral gas experiment
<i>Period</i>	<i>Obligations</i>		
05/01/82-03/31/88	FY89:	TOTAL: \$304,898	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hsieh, K. C.	HQ-EL/Brinton, H. C.	11-Astronomy	
	HQ-EL/Brunk, W.		
NASW 3703	University of Arizona	1427	Space astronomy infrared detector development
<i>Period</i>	<i>Obligations</i>		
11/01/82-05/15/88	FY89:	TOTAL: \$753,647	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Low, F. J.	HQ-EZ/Bogges, N. W.	11-Astronomy	
	HQ-EZ/Weiler, E. J.		

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ARIZONA (Continued)

NASW 4245 University of Arizona 1428
 Miniature monochromatic imager
Period *Obligations*
 09/15/87-06/14/90 FY89: TOTAL: \$199,845
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Broadfoot, A. L. HQ-EL/Evans, L. G. 13-Physics
 HQ-EL/Quaide, W.

NASW 4389 University of Arizona 1429
 Workshop and textbook of the interior and atmosphere of the Sun
Period *Obligations*
 07/12/89-07/11/90 FY89: \$7,809 TOTAL: \$7,809
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Gehreis, T. HQ-ES/Ahluwalia, H. S. 11-Astronomy
 Cox, A. M.
 Livingston, W. C.

NAS10-11390 University of Arizona 1430
 Lightning charges and thunderstorm currents at the Kennedy Space Center
Period *Obligations*
 03/18/87-10/31/89 FY89: \$10,227 TOTAL: \$155,227
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Krider, E. P. KSC/Wesenberg, R. P. 31-Atmos Sci

NCA 2-349 University of Arizona 1431
 Plant canopy reflectance a transport theory investigation
Period *Obligations*
 09/01/88-08/31/89 FY89: \$9,500 TOTAL: \$19,898
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Ganapol, B. D. ARC/Lawless, J. G. 39-Env Sci, NEC

NCA 2-405 University of Arizona 1432
 Seasonal variation of water vapor in the Martian Southern Hemisphere
Period *Obligations*
 05/01/89-12/01/89 FY89: \$3,002 TOTAL: \$3,002
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Fink, U. ARC/Stoker, C. 11-Astronomy
 Wells, K. ARC/Pollack, J. B.

NCC 2-329 University of Arizona 1433
 Analysis of turbulence encounters using airline digital flight records
Period *Obligations*
 01/01/85-12/31/89 FY89: TOTAL: \$81,973
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Parks, E. K. ARC/Wingrove, R. C. 41-Aero Engr
 ARC/Bach, R. E.

NCC 2-426 University of Arizona 1434
 Design of the SIRT primary mirror mount
Period *Obligations*
 06/01/86-01/31/90 FY89: \$223,512 TOTAL: \$573,512
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Richard, R. M. ARC/Melugin, R. K. 99-Multi-Discip
 Vukobratovich, D. ARC/Sarver, G. L.

NCC 2-439 University of Arizona 1435
 Innovative optical approaches to space astrometry
Period *Obligations*
 10/01/86-09/30/90 FY89: TOTAL: \$106,595
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Levy, E. H. ARC/Nishioka, K. 11-Astronomy
 Gatewood, G. D. ARC/Scargle, J. D.
 Lawrence, G.

NCC 2-525 University of Arizona 1436
 A simulation environment for laboratory management of robot organizations
Period *Obligations*
 10/01/87-10/31/89 FY89: \$119,911 TOTAL: \$264,962
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Zeigler, B. P. ARC/Friedland, P. E. 22-Computer Science
 ARC/Rosenthal, D. A.

NCC 2-561 University of Arizona 1437
 Topics in naming
Period *Obligations*
 09/01/88-08/31/90 FY89: \$300,346 TOTAL: \$300,346
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Peterson, L. ARC/Jones, W. P. 22-Computer Science
 ARC/Siegel, M.

NGL 03-002-002 University of Arizona 1438
 Planetary, spectroscopic, selenodetic and physical studies of lunar surface
Period *Obligations*
 08/12/61-12/31/88 FY89: \$51,851 TOTAL: \$3,631,979
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Smith, B. A. HQ-EL/Brinton, H. C. 11-Astronomy
 HQ-EL/Rahe, J. H.

NGL 03-002-081 University of Arizona 1439
 Photometry and polarimetry of minor planets
Period *Obligations*
 03/14/66-03/31/89 FY89: TOTAL: \$831,187
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Taylor, R. C. HQ-EL/Brinton, H. C. 11-Astronomy
 HQ-EL/Rahe, J. H.

NGR 03-002-269 University of Arizona 1440
 Operation of a 30 cm flying infrared telescope
Period *Obligations*
 05/04/71-05/31/89 FY89: TOTAL: \$1,145,030
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Low, F. J. HQ-EZ/Caroff, L. J. 11-Astronomy
 HQ-EZ/Weiler, E. J.

NGR 03-002-371 University of Arizona 1441
 Far infrared observations of galactic and extra-galactic sources of radiation
Period *Obligations*
 09/01/73-12/14/88 FY89: TOTAL: \$1,184,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Hoffmann, W. HQ-EZ/Stachnik, R. V. 11-Astronomy
 HQ-EZ/Weiler, E. J.

NGT 00-050-019 University of Arizona 1442
 NASA graduate student researchers program
Period *Obligations*
 07/01/86-06/30/88 FY89: TOTAL: \$35,190
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Tischler, M. E. HQ-LE/Owens, F. C. 51-Biological Sci

NGT 00-050-027 University of Arizona 1443
 NASA graduate student researchers program
Period *Obligations*
 06/01/86-11/30/89 FY89: TOTAL: \$53,400
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Fink, U. HQ-LE/Owens, F. C. 13-Physics

**NASA'S UNIVERSITY PROGRAM
ARIZONA (Continued)**

NGT 00-050-048	University of Arizona	1444	NGT 00-050-270	University of Arizona	1453
NASA graduate student researchers program			NASA graduate student researchers program		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
08/15/86-08/13/89	FY89: \$7,663	TOTAL: \$61,063	08/01/88-07/31/90	FY89: \$18,000	TOTAL: \$36,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Lebofsky, L. A.	HQ-LE/Owens, F. C.	99-Multi-Discip	Levine, M. L.	HQ-XE/Owens, F. C.	51-Biological Sci
			Bier, M.		
NGT 00-050-049	University of Arizona	1445	NGT 00-050-273	University of Arizona	1454
NASA graduate student researchers program			NASA graduate student researchers program		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
08/16/86-08/15/89	FY89:	TOTAL: \$53,500	08/01/88-07/31/90	FY89: \$18,000	TOTAL: \$36,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hubbard, W. B.	HQ-LE/Owens, F. C.	32-Geological Sci	Sorooshian, S.	HQ-EE/Asrar, G.	39-Env Sci, NEC
			Humes, K. S.	HQ-EE/Ruzek, M.	
NGT 00-050-050	University of Arizona	1446	NGT 00-050-274	University of Arizona	1455
NASA graduate student researchers program			NASA graduate student researchers program		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
08/16/86-08/15/89	FY89:	TOTAL: \$53,736	08/01/88-07/31/90	FY89: \$18,000	TOTAL: \$36,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hunten, D. M.	HQ-LE/Owens, F. C.	32-Geological Sci	Teschlea, M. E.	HQ-XE/Schwartz, E.	19-Phys Sci, NEC
			Kirby, C.		
NGT 00-050-051	University of Arizona	1447	NGT 00-050-287	University of Arizona	1456
NASA graduate student researchers program			NASA graduate student researchers program		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
08/25/86-12/14/90	FY89:	TOTAL: \$68,013	08/01/88-07/31/90	FY89: \$18,000	TOTAL: \$35,992
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Drake, M. J.	HQ-LE/Owens, F. C.	12-Chemistry	Weinberg, M. C.	HQ-XE/Owens, F. C.	12-Chemistry
NGT 00-050-074	University of Arizona	1448	NGT 00-050-303	University of Arizona	1457
NASA graduate student researchers program			NASA graduate student researchers program		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
08/01/86-12/31/89	FY89:	TOTAL: \$53,977	08/01/88-07/31/90	FY89: \$18,000	TOTAL: \$36,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Fasel, H.	HQ-LE/Owens, F. C.	41-Aero Engr	Shemansky, D. E.	HQ-XE/Owens, F. C.	13-Physics
NGT 00-050-076	University of Arizona	1449	NGT 00-050-305	University of Arizona	1458
NASA graduate student researchers program			NASA graduate student researchers program		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
08/15/86-03/14/90	FY89:	TOTAL: \$54,000	08/01/88-07/31/90	FY89: \$18,000	TOTAL: \$36,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Glezer, A.	HQ-LE/Owens, F. C.	41-Aero Engr	Holberg, J. B.	HQ-XE/Owens, F. C.	13-Physics
NGT 00-050-186	University of Arizona	1450	NGT 00-050-307	University of Arizona	1459
NASA graduate student researchers program			NASA graduate student researchers program		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
06/01/87-05/31/88	FY89:	TOTAL: \$18,000	08/15/88-08/14/90	FY89: \$18,000	TOTAL: \$35,270
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Lewis, J. S.	HQ-XE/Owens, F. C.	11-Astronomy	Pearlstein, A. J.	HQ-XE/Owens, F. C.	21-Mathematics
NGT 00-050-234	University of Arizona	1451	NGT 00-050-319	University of Arizona	1460
NASA graduate student researchers program			NASA graduate student researchers program		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
08/15/87-08/14/90	FY89: \$18,000	TOTAL: \$53,900	08/01/88-07/31/90	FY89: \$17,982	TOTAL: \$35,938
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Melosh, H. J.	HQ-XE/Owens, F. C.	32-Geological Sci	Martin	HQ-XE/Owens, F. C.	11-Astronomy
NGT 00-050-235	University of Arizona	1452	NGT 00-050-331	University of Arizona	1461
NASA graduate student researchers program			NASA graduate student researchers program		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
08/16/87-08/15/90	FY89: \$18,000	TOTAL: \$54,000	09/01/88-08/31/89	FY89:	TOTAL: \$18,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Boynton, W. V.	HQ-XE/Owens, F. C.	32-Geological Sci	Green, R.	HQ-XE/Owens, F. C.	11-Astronomy

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NGT 00-050-382 University of Arizona 1462
NASA graduate student researchers program
Period Obligations
09/01/88-08/31/90 FY89: TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Low, F. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-477 University of Arizona 1463
NASA graduate student researchers program
Period Obligations
08/15/89-08/14/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Hubbard, W. B. HQ-XE/Owens, F. C. 19-Phys Sci, NEC

NGT 00-050-479 University of Arizona 1464
NASA graduate student researchers program
Period Obligations
08/15/89-08/14/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Lunine, J. I. HQ-XE/Owens, F. C. 19-Phys Sci, NEC

NGT 00-050-493 University of Arizona 1465
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Tipton, C. HQ-XE/Owens, F. C. 59-Life Sci, NEC

NGT 00-070-071 University of Arizona 1466
NASA graduate student researchers program
Period Obligations
01/01/88-12/31/89 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Ramohalli, K. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 00-070-140 University of Arizona 1467
NASA graduate student researchers underrepresented minority focus program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Ramohalli, K. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 03-002-803 University of Arizona 1468
NASA graduate student researchers program
Period Obligations
08/16/85-12/31/88 FY89: TOTAL: \$53,600
Prin. Invest. NASA Tech. Officer CASE Category
Lewis, J. S. HQ-LE/Owens, F. C. 11-Astronomy

NGT 03-002-805 University of Arizona 1469
NASA graduate student researchers program
Period Obligations
08/20/85-08/19/88 FY89: TOTAL: \$49,601
Prin. Invest. NASA Tech. Officer CASE Category
Lebofsky, M. J. HQ-LE/Owens, F. C. 11-Astronomy

NGT 03-002-807 University of Arizona 1470
NASA graduate student researchers program
Period Obligations
09/01/85-08/31/88 FY89: TOTAL: \$50,250
Prin. Invest. NASA Tech. Officer CASE Category
Rieke, G. HQ-LE/Owens, F. C. 11-Astronomy

NGT 03-002-809 University of Arizona 1471
NASA graduate student researchers program
Period Obligations
08/01/85-12/31/88 FY89: TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Fasel, H. HQ-LE/Owens, F. C. 46-Mech Engr

NSG 7020 University of Arizona 1472
Investigation of lunar induced and permanent magnetism in the lunar data analysis and synthesis program
Period Obligations
03/01/74-10/31/89 FY89: \$25,500 TOTAL: \$1,065,580
Prin. Invest. NASA Tech. Officer CASE Category
Hood, L. L. HQ-EL/Underwood, J. R. 32-Geological Sci
HQ-EL/Boyce, J. M.

NSG 7045 University of Arizona 1473
Interiors of the giant planets
Period Obligations
04/01/74-03/31/90 FY89: \$10,500 TOTAL: \$545,621
Prin. Invest. NASA Tech. Officer CASE Category
Hubbard, W. B. HQ-EL/Brinton, H. C. 11-Astronomy
HQ-EL/Rahe, J. H.

NSG 7070 University of Arizona 1474
Planetary spectroscopy
Period Obligations
06/01/74-06/30/89 FY89: TOTAL: \$1,603,445
Prin. Invest. NASA Tech. Officer CASE Category
Fink, U. W. HQ-EL/Brinton, H. C. 11-Astronomy
HQ-EL/Rahe, J. H.

NSG 7101 University of Arizona 1475
Study structure of astrophysical plasma and turbulent fluctuations
Period Obligations
11/18/74-10/31/89 FY89: \$100,450 TOTAL: \$1,015,574
Prin. Invest. NASA Tech. Officer CASE Category
Jokipii, J. R. HQ-ES/Mellott, M. M. 11-Astronomy
HQ-ES/Jones, W. V.

NSG 7114 University of Arizona 1476
Infrared observations of the planets
Period Obligations
02/20/75-12/31/89 FY89: \$41,994 TOTAL: \$454,960
Prin. Invest. NASA Tech. Officer CASE Category
Lebofsky, L. A. HQ-EL/Brinton, H. C. 11-Astronomy
HQ-EL/Rahe, J. H.

NSG 7146 University of Arizona 1477
Geologic investigation of Mercury from Mariner 10 television data
Period Obligations
07/01/75-09/30/89 FY89: \$49,100 TOTAL: \$944,570
Prin. Invest. NASA Tech. Officer CASE Category
Strom, R. G. HQ-EL/Underwood, J. 32-Geological Sci
HQ-EL/Boyce, J. M.

NSG 7419 University of Arizona 1478
Generation and behavior of solar system magnetic fields
Period Obligations
03/01/79-09/30/89 FY89: \$60,700 TOTAL: \$746,185
Prin. Invest. NASA Tech. Officer CASE Category
Levy, E. H. HQ-EL/Underwood, J. 32-Geological Sci
HQ-EL/Boyce, J. M.

**NASA'S UNIVERSITY PROGRAM
ARIZONA (Continued)**

NSG 7558 University of Arizona 1479
Planetary aeronomy and related studies
Period Obligations
04/01/79-09/30/89 FY89: \$50,000 TOTAL: \$409,259
Prin. Invest. NASA Tech. Officer CASE Category
Hunten, D. M. HQ-EL/Bergstrahl, J. T. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NSG 7573 University of Arizona 1480
Scattering of light by amonia crystals
Period Obligations
09/01/78-08/31/89 FY89: \$75,000 TOTAL: \$637,372
Prin. Invest. NASA Tech. Officer CASE Category
Tomasko, M. G. HQ-EL/Bergstrahl, J. T. 31-Atmos Sci
HQ-EL/Quaide, W. L.

ARKANSAS

NAG 9-222 Arkansas College 1481
Determination of hydrogen abundance in selected lunar soils
Period Obligations
06/01/87-11/01/87 FY89: TOTAL: \$8,300
Prin. Invest. NASA Tech. Officer CASE Category
Bustin, R. JSC/Gibson, E. K. 12-Chemistry

NAG 9-272 Arkansas College 1482
Methods for extracting hydrogen from lunar soil
Period Obligations
04/01/88-08/01/89 FY89: TOTAL: \$8,300
Prin. Invest. NASA Tech. Officer CASE Category
Bustin, R. JSC/Gibson, E. 32-Geological Sci

NAG 9-373 Arkansas College 1483
Hydrogen in lunar soil
Period Obligations
06/01/89-11/01/89 FY89: \$8,300 TOTAL: \$8,300
Prin. Invest. NASA Tech. Officer CASE Category
Bustin, R. JSC/Gibson, E. 12-Chemistry

NAG 1-731 Arkansas State University 1484
Navier-Stokes simulation of the cross flow instability in swept wing flows
Period Obligations
01/01/87-07/31/88 FY89: TOTAL: \$59,402
Prin. Invest. NASA Tech. Officer CASE Category
Reed, H. L. LARC/Maddalon, D. V. 41-Aero Engr
LARC/Hefner, J. N.

NCC 1-124 Arkansas State University 1485
Data link weather information requirements for cost efficient air traffic control compatible airplane flight paths
Period Obligations
08/15/88-08/15/90 FY89: \$106,903 TOTAL: \$135,028
Prin. Invest. NASA Tech. Officer CASE Category
Scanlon, C. H. LARC/Knox, C. E. 41-Aero Engr
LARC/Steinmetz, G. G.

NAG 2-147 University of Arkansas - Fayetteville 1486
A feasibility study of the application of an airborne spectrophone instrument for the measurement of aerosol light absorption
Period Obligations
12/01/81-06/30/90 FY89: TOTAL: \$61,481
Prin. Invest. NASA Tech. Officer CASE Category
Mazumder, M. K. ARC/Ragent, B. 31-Atmos Sci
Wilson, J. D.
Tennal, K. B.

NAG 3-802 University of Arkansas - Fayetteville 1487
Study of Staebler-Wronski degradation effect in a Si: H based p-i-n solar cells
Period Obligations
06/05/87-07/04/88 FY89: TOTAL: \$55,000
Prin. Invest. NASA Tech. Officer CASE Category
Hermann, A. M. LERC/Weizer, V. G. 45-Elec Engr
Naseen, H.

NAG 3-920 University of Arkansas - Fayetteville 1488
Staebler-Wronski effect
Period Obligations
07/01/88-01/31/90 FY89: \$45,000 TOTAL: \$51,998
Prin. Invest. NASA Tech. Officer CASE Category
Hermann, A. M. LERC/Weizer, V. G. 45-Elec Engr
Naseem, H.

NAG 9-81 University of Arkansas - Fayetteville 1489
Chemical and physical studies of type 3 chondrites
Period Obligations
03/01/84-03/01/90 FY89: \$73,500 TOTAL: \$323,500
Prin. Invest. NASA Tech. Officer CASE Category
Sears, D. W. JSC/Browne, I. D. 32-Geological Sci

NGT 00-050-064 University of Arkansas - Fayetteville 1490
NASA graduate student researchers program
Period Obligations
06/01/86-07/31/89 FY89: TOTAL: \$53,250
Prin. Invest. NASA Tech. Officer CASE Category
Sears, D. W. HQ-LE/Owens, F. C. 12-Chemistry

NAS10-11604 University of Arkansas - Little Rock 1491
Uniform particle counter development
Period Obligations
08/28/89-04/27/90 FY89: \$29,698 TOTAL: \$29,698
Prin. Invest. NASA Tech. Officer CASE Category
Adams, A. KSC/Mogan, P. 13-Physics
KSC/Helms, W.

NGT 00-070-013 University of Arkansas - Little Rock 1492
NASA graduate student researchers program
Period Obligations
02/01/87-01/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Mazumder, M. K. HQ-LE/Owens, F. C. 31-Atmos Sci

NAG 2-427 Univ. of Arkansas - Pine Bluff 1493
The neurochemical and neuropharmacological basis of motion sickness
Period Obligations
12/15/86-08/14/89 FY89: TOTAL: \$58,000
Prin. Invest. NASA Tech. Officer CASE Category
Walker, C. A. ARC/Daunton, N. G. 51-Biological Sci

NASA'S UNIVERSITY PROGRAM CALIFORNIA

CALIFORNIA

NAG 1-474 California Institute of Technology 1494
An initiation program on toughness of matrix materials for advanced composites

Period	FY89:	Obligations	TOTAL:
05/01/84-09/30/88			\$160,028
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Knauss, W. G.	LARC/Crews Jr., J. H.	47-Materials Engr	
	LARC/Johnston, N. J.		

NAG 1-842 California Institute of Technology 1495
Investigation of a contoured wall injector for hypervelocity mixing

Period	FY89:	Obligations	TOTAL:
03/01/88-02/28/90	\$150,000		\$405,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Marble, F. E.	LARC/Anders, J. B.	41-Aero Engr	

NAG 1-967 California Institute of Technology 1496
Mu based u-based control design as applied to large space structures

Period	FY89:	Obligations	TOTAL:
01/10/89-01/09/90	\$100,940		\$100,940
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Doyle, J. C.	LARC/Taylor, R. S.	42-Astro Engr	
	LARC/Armstrong, E. S.		

NAG 2-1 California Institute of Technology 1497
Submillimeter line astronomy on the NASA 91.5 cm/ airborne telescope

Period	FY89:	Obligations	TOTAL:
10/01/79-09/30/89			\$644,952
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Phillips, T. G.	ARC/Haughney, L. C.	11-Astronomy	
Keene, J.			

NAG 2-476 California Institute of Technology 1498
High resolution far infrared studies of compact regions of star forming molecular clouds

Period	FY89:	Obligations	TOTAL:
10/01/87-09/30/88			\$13,691
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Mundy, L.	ARC/Haughney, L. C.	11-Astronomy	

NAG 2-534 California Institute of Technology 1499
High resolutions observations of M33 and 50 and 10UM

Period	FY89:	Obligations	TOTAL:
10/01/88-12/31/89			\$14,338
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Scoville, N. Z.	ARC/Haughney, L. C.	11-Astronomy	

NAG 5-508 California Institute of Technology 1500
Investigations of Solar Maximum Mission data

Period	FY89:	Obligations	TOTAL:
03/01/85-08/31/89			\$159,500
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Zirin, H.	GSFC/Bullock, G. D.	13-Physics	
	GSFC/Gurman, J. B.		

NAG 5-722 California Institute of Technology 1501
Research relative to the heavy isotope spectrometer telescope

Period	FY89:	Obligations	TOTAL:
12/01/85-11/30/89	\$63,509		\$284,528
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Stone, E. C.	GSFC/Wales, R.	11-Astronomy	
Mewaldt, R. A.			

NAG 5-727 California Institute of Technology 1502

Research relative to the Caltech/isotoyce spectrometer

Period	FY89:	Obligations	TOTAL:
12/20/85-02/28/90	\$68,297		\$229,288
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Stone, E. C.	GSFC/Wales, R. O.	31-Atmos Sci	
Mewaldt, R. A.			

NAG 5-819 California Institute of Technology 1503

Earth rotation and core topography

Period	FY89:	Obligations	TOTAL:
08/15/86-09/14/87			\$60,057
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hager, B. H.	GSFC/Welker, J. E.	32-Geological Sci	

NAG 5-842 California Institute of Technology 1504

Intraplate deformation stress in the lithosphere and the driving mechanism for plate motions

Period	FY89:	Obligations	TOTAL:
09/01/86-03/31/90	\$56,001		\$198,543
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hager, B. H.	GSFC/Frey, H. V.	32-Geological Sci	

NAG 5-878 California Institute of Technology 1505

Bevalac studies of magnet Chereukou isotope spectroscopy

Period	FY89:	Obligations	TOTAL:
02/15/87-10/14/90	\$17,775		\$38,087
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Mewaldt, R. A.	GSFC/Ormes, J. F.	13-Physics	
Stone, E. C.			

NAG 5-946 California Institute of Technology 1506

Accelerated flare electrons using microwave and hard X ray spectroscopy SMM

Period	FY89:	Obligations	TOTAL:
10/01/87-09/30/89	\$34,002		\$63,962
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Huford, G.	GSFC/Bullock, G. D.	19-Phys Sci, NEC	
Zirin, H.	GSFC/Gurman, J. B.		

NAG 5-958 California Institute of Technology 1507

The O star and planetary nebula

Period	FY89:	Obligations	TOTAL:
08/01/87-01/31/89			\$12,300
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Cohen, J. G.	GSFC/Kondo, Y.	11-Astronomy	
Gillet, F. C.			

NAG 5-998 California Institute of Technology 1508

Detector and subcollimator requirements for a balloon based gamma ray imaging device

Period	FY89:	Obligations	TOTAL:
09/01/87-10/14/90	\$39,512		\$67,740
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Zirin, H.	GSFC/Crannell, C. J.	11-Astronomy	
Prince, T. A.			

NAG 5-1095 California Institute of Technology 1509

High time resolution videotape recording of solar flares

Period	FY89:	Obligations	TOTAL:
10/15/88-10/14/89	\$24,993		\$24,993
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Zirin, H.	GSFC/Bullock, G. D.	19-Phys Sci, NEC	
	GSFC/Gulman, J. B.		

**NASA'S UNIVERSITY PROGRAM
CALIFORNIA (Continued)**

NAG 5-1153 California Institute of Technology 1510
Measurement of the sizes of circumstellar dust shells around evolved stars with high mass loss
Period *Obligations*
06/15/89-06/14/90 FY89: \$33,240 TOTAL: \$33,240
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Phillips, T. G. GSFC/West, D. 11-Astronomy

NAG 5-1161 California Institute of Technology 1511
Astrophysics data research programs
Period *Obligations*
07/01/89-06/30/90 FY89: \$63,902 TOTAL: \$63,902
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Scoville, N. Z. GSFC/West, D. 11-Astronomy

NAG 5-1162 California Institute of Technology 1512
Studies of bright galaxies and active galaxies using the infrared astronomy satellite IRAS data base
Period *Obligations*
07/15/89-01/14/90 FY89: \$47,950 TOTAL: \$47,950
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Soifer, B. T. GSFC/West, D. 11-Astronomy

NAG 5-1163 California Institute of Technology 1513
Astrophysics data research program
Period *Obligations*
07/01/89-12/31/89 FY89: \$71,950 TOTAL: \$71,950
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Neugebauer, G. GSFC/West, D. 11-Astronomy

NAG 5-1164 California Institute of Technology 1514
High resolution infrared astronomy satellite observations of a selected spiral galaxy
Period *Obligations*
07/15/89-01/14/90 FY89: \$19,500 TOTAL: \$19,500
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Kulkarni, S. R. GSFC/West, D. 11-Astronomy

NAG 5-1165 California Institute of Technology 1515
Young circumstellar disks and time scales for planet formation
Period *Obligations*
07/15/89-07/14/90 FY89: \$13,900 TOTAL: \$13,900
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Sargent, A. I. GSFC/West, D. 11-Astronomy

NAG 5-1173 California Institute of Technology 1516
Color and population gradients in globular cluster cores
Period *Obligations*
07/15/89-07/14/90 FY89: \$20,360 TOTAL: \$20,360
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Djorgovski, S. GSFC/West, D. 11-Astronomy

NAG 8-118 California Institute of Technology 1517
Unsteady forces in turbomachines
Period *Obligations*
01/12/89-01/12/90 FY89: \$152,004 TOTAL: \$152,004
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Brennen, C. E. MSFC/Stinson, H. P. 46-Mech Engr
MSFC/Key, N.

NAG 8-502 California Institute of Technology 1518
Post launch analysis of data from the High Energy Astrophysical Observatory heavy nuclei experiment (HEAO-C3)
Period *Obligations*
10/01/84-09/30/89 FY89: \$194,989 TOTAL: \$1,052,026
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Stone, E. C. MSFC/Havrisik, D. 11-Astronomy

NAG 8-669 California Institute of Technology 1519
Fourier transform imaging technology for the NASA pin hole occulter
Period *Obligations*
07/22/87-07/21/88 FY89: TOTAL: \$20,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Prince, T. A. MSFC/Dabbs, J. 99-Multi-Discip

NAG 8-678 California Institute of Technology 1520
New aspects of heavy cosmic rays from calcium to nickel 20 to 28
Period *Obligations*
08/01/87-07/31/90 FY89: TOTAL: \$44,793
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Mewaldt, R. A. MSFC/Harper, B. A. 11-Astronomy
Webber, W. R.

NAG 8-707 California Institute of Technology 1521
Vector magnetic fields in solar active regions
Period *Obligations*
03/14/88-03/13/89 FY89: TOTAL: \$16,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Zirin, H. MSFC/Hagyard, M. J. 11-Astronomy
MSFC/Moore, R. L.

NAG 8-776 California Institute of Technology 1522
Simulation p of hard X ray and gamma ray imaging instruments
Period *Obligations*
05/01/89-04/30/90 FY89: \$49,786 TOTAL: \$49,786
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Zirin, H. MSFC/Dabbs, J. R. 11-Astronomy
Hurford, G. J.

NAG 9-43 California Institute of Technology 1523
Geochemical and isotopic investigation of lunar and planetary materials and interplanetary dust
Period *Obligations*
02/01/83-12/01/89 FY89: \$1,102,000 TOTAL: \$7,013,080
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wasserburg, G. J. JSC/Browne, I. D. 32-Geological Sci

NAG 9-46 California Institute of Technology 1524
Application of stable isotope measurement to the origin and history of lunar samples and meteorites
Period *Obligations*
02/01/83-02/01/90 FY89: \$105,092 TOTAL: \$601,357
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Epstein, S. JSC/Browne, I. D. 12-Chemistry

NAG 9-94 California Institute of Technology 1525
Solar system chemistry
Period *Obligations*
02/01/85-02/01/90 FY89: \$120,000 TOTAL: \$505,784
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Burnett, D. S. JSC/Browne, I. D. 47-Materials Engr

NASA'S UNIVERSITY PROGRAM **CALIFORNIA (Continued)**

NAG 9-105 California Institute of Technology 1526
 Experimental studies of phase equilibria of meteorites planetary interiors
Period Obligations
 01/01/85-02/01/90 FY89: \$100,897 TOTAL: \$431,581
Prin. Invest. NASA Tech. Officer CASE Category
 Stolper, E. JSC/Browne, I. D. 19-Phys Sci, NEC

NAG 9-185 California Institute of Technology 1527
 Lunar and meteoritic samples
Period Obligations
 10/01/86-05/01/90 FY89: TOTAL: \$54,300
Prin. Invest. NASA Tech. Officer CASE Category
 Albee, A. L. JSC/Browne, I. D. 32-Geological Sci

NAG 9-236 California Institute of Technology 1528
 Solubility of noble gases and nitrogen in silicate melts to 5000 bars
Period Obligations
 06/01/87-12/01/88 FY89: TOTAL: \$33,000
Prin. Invest. NASA Tech. Officer CASE Category
 Stopler, E. M. JSC/Browne, I. D. 32-Geological Sci

NAG 9-294 California Institute of Technology 1529
 Early siliceous crust experimental petrology of trondhjemite
Period Obligations
 05/01/88-05/01/90 FY89: \$30,000 TOTAL: \$60,000
Prin. Invest. NASA Tech. Officer CASE Category
 Wyllie, P. JSC/Browne, I. D. 32-Geological Sci

NAGW 58 California Institute of Technology 1530
 Dynamics of planetary atmospheres
Period Obligations
 05/01/80-11/30/89 FY89: \$39,583 TOTAL: \$919,047
Prin. Invest. NASA Tech. Officer CASE Category
 Ingersoll, A. P. HQ-EL/Bergstralh, J. T. 31-Atmos Sci
 HQ-EL/Quaide, W. L.

NAGW 107 California Institute of Technology 1531
 Development of InSb detectors for submillimeter astronomy
Period Obligations
 11/01/80-10/31/89 FY89: \$81,000 TOTAL: \$779,977
Prin. Invest. NASA Tech. Officer CASE Category
 Phillips, T. G. HQ-EZ/Gillett, F. C. 11-Astronomy
 HQ-EZ/Weiler, E. J.

NAGW 185 California Institute of Technology 1532
 High pressure cosmochemistry applied to major planetary interiors
Period Obligations
 04/01/81-09/30/89 FY89: \$66,700 TOTAL: \$592,691
Prin. Invest. NASA Tech. Officer CASE Category
 Stevenson, D. J. HQ-EL/Underwood, J. 32-Geological Sci
 HQ-EL/Boyce, J. M.

NAGW 413 California Institute of Technology 1533
 Photochemical modeling of trace species in the stratosphere and mesosphere
Period Obligations
 01/01/83-10/31/89 FY89: \$75,000 TOTAL: \$791,639
Prin. Invest. NASA Tech. Officer CASE Category
 Yung, Y. L. HQ-EE/Jackman, C. H. 31-Atmos Sci
 Kruse, T. H. HQ-EE/Butler, D. M.

NAGW 832 California Institute of Technology 1534
 Development of a narrow-band filter for the carbon IV 1550 line
Period Obligations
 11/15/85-08/31/89 FY89: TOTAL: \$10,806
Prin. Invest. NASA Tech. Officer CASE Category
 Zirin, H. HQ-EZ/Gergely, T. E. 13-Physics

NAGW 1204 California Institute of Technology 1535
 A dynamo excitation mechanism for the electroglow on Uranus
Period Obligations
 10/01/87-09/30/89 FY89: TOTAL: \$35,000
Prin. Invest. NASA Tech. Officer CASE Category
 Yung, Y. L. HQ-EL/Quaide, W. L. 11-Astronomy
 HQ-EL/Brinton, H. C.

NAGW 1213 California Institute of Technology 1536
 Interpretation and correlation of the uranian magnetic field
Period Obligations
 09/15/87-09/15/90 FY89: \$74,807 TOTAL: \$112,352
Prin. Invest. NASA Tech. Officer CASE Category
 Stevenson, D. J. HQ-EL/Quaide, W. L. 19-Phys Sci, NEC
 HQ-EL/Slavin, J. A.

NAGW 1219 California Institute of Technology 1537
 Meteorology of Uranus
Period Obligations
 10/01/87-09/30/89 FY89: TOTAL: \$40,378
Prin. Invest. NASA Tech. Officer CASE Category
 Ingersoll, A. P. HQ-EL/Quaide, W. L. 19-Phys Sci, NEC
 HQ-EL/Fox, K.

NAGW 1226 California Institute of Technology 1538
 Mars geologic mapping in the south polar region
Period Obligations
 10/01/87-03/31/90 FY89: \$9,952 TOTAL: \$19,904
Prin. Invest. NASA Tech. Officer CASE Category
 Murray, B. HQ-EL/Underwood, J. 32-Geological Sci
 HQ-EL/Boyce, J. M.

NAGW 1301 California Institute of Technology 1539
 Theoretical studies of active galactic nuclei
Period Obligations
 06/01/88-12/31/89 FY89: \$215,767 TOTAL: \$420,493
Prin. Invest. NASA Tech. Officer CASE Category
 Blandford, R. D. HQ-EZ/Clay, G. S. 13-Physics
 HQ-ES/Jones, W. V.

NAGW 1303 California Institute of Technology 1540
 Investigation of stellar oscillations
Period Obligations
 02/01/88-01/31/90 FY89: \$114,000 TOTAL: \$224,000
Prin. Invest. NASA Tech. Officer CASE Category
 Goldreich, P. HQ-EZ/Clayton, G. C. 11-Astronomy
 HQ-ES/Jones, W. V.

NAGW 1373 California Institute of Technology 1541
 Surficial volatiles and chemical weathering on Mars
Period Obligations
 03/01/88-10/31/89 FY89: \$16,700 TOTAL: \$41,700
Prin. Invest. NASA Tech. Officer CASE Category
 Murray, B. C. HQ-EL/Underwood, J. R. 32-Geological Sci

NASA'S UNIVERSITY PROGRAM **CALIFORNIA (Continued)**

NAGW 1426 California Institute of Technology 1542
 Spacecraft studies of Phobos and Mars
Period Obligations
 06/01/88-10/31/89 FY89: \$122,223 TOTAL: \$122,223
Prin. Invest. NASA Tech. Officer CASE Category
 Murray, B. HQ-EL/Quaide, W. L. 11-Astronomy

NAGW 1427 California Institute of Technology 1543
 Solubility of noble gases and nitrogen in silicate melts to 5000 bars
Period Obligations
 06/01/88-05/31/90 FY89: \$33,000 TOTAL: \$66,000
Prin. Invest. NASA Tech. Officer CASE Category
 Stolper, E. M. HQ-EL/Underwood, J. R. 19-Phys Sci, NEC

NAGW 1432 California Institute of Technology 1544
 Millimeter spectrometer and radiometer Cassini MSAR instrument development
Period Obligations
 07/01/88-09/30/90 FY89: \$133,000 TOTAL: \$233,100
Prin. Invest. NASA Tech. Officer CASE Category
 Muhleman, D. O. HQ-EL/Mahaffy, P. R. 32-Geological Sci

NAGW 1435 California Institute of Technology 1545
 The isotopic composition of hydrogen, carbon, nitrogen and oxygen in organic matter in meteorites - their possible implications to the origin of life on Earth
Period Obligations
 07/01/88-06/30/89 FY89: TOTAL: \$50,078
Prin. Invest. NASA Tech. Officer CASE Category
 Epstein, S. HQ-EB/Rummel, J. D. 12-Chemistry
 HQ-EL/Boyce, J.

NAGW 1445 California Institute of Technology 1546
 Convection in Venus observations models and comparison with Earth
Period Obligations
 06/01/88-12/31/89 FY89: \$34,200 TOTAL: \$58,325
Prin. Invest. NASA Tech. Officer CASE Category
 Albee, A. HQ-EL/Underwood, J. R. 32-Geological Sci

NAGW 1448 California Institute of Technology 1547
 Lunar and planetary studies
Period Obligations
 12/01/88-11/30/89 FY89: TOTAL: \$150,000
Prin. Invest. NASA Tech. Officer CASE Category
 Muhleman, D. O. HQ-EL/Rahe, J. H. 11-Astronomy

NAGW 1478 California Institute of Technology 1548
 Investigator support on infrared space observation
Period Obligations
 10/01/88-10/31/89 FY89: \$27,895 TOTAL: \$27,895
Prin. Invest. NASA Tech. Officer CASE Category
 Sargent, A. I. HQ-EZ/Gillett, F. C. 11-Astronomy

NAGW 1499 California Institute of Technology 1549
 Synthetic aperture planetary radar astronomy using the very large array
Period Obligations
 11/01/88-10/31/89 FY89: \$30,000 TOTAL: \$30,000
Prin. Invest. NASA Tech. Officer CASE Category
 Muhleman, D. O. HQ-EL/Rahe, J. H. 11-Astronomy

NAGW 1509 California Institute of Technology 1550
 Photochemical studies of chemistry in the outer solar system and in the solar nebular
Period Obligations
 01/01/89-12/31/89 FY89: \$100,599 TOTAL: \$100,599
Prin. Invest. NASA Tech. Officer CASE Category
 Yung, Y. L. HQ-EL/Bergstralh, J. T. 11-Astronomy

NAGW 1538 California Institute of Technology 1551
 Photochemical and thermal modeling of the early atmosphere of the Earth
Period Obligations
 12/01/88-11/30/89 FY89: \$30,000 TOTAL: \$30,000
Prin. Invest. NASA Tech. Officer CASE Category
 Yung, Y. L. HQ-EB/Rummel, J. D. 31-Atmos Sci

NAGW 1706 California Institute of Technology 1552
 Microwave spectroscopy of the active Sun
Period Obligations
 10/01/88-09/30/89 FY89: \$72,687 TOTAL: \$72,687
Prin. Invest. NASA Tech. Officer CASE Category
 Hurlford, G. HQ-/Bohlin, J. D. 11-Astronomy

NAGW 1710 California Institute of Technology 1553
 Palomar observatory
Period Obligations
 03/01/89-02/28/90 FY89: \$39,850 TOTAL: \$39,850
Prin. Invest. NASA Tech. Officer CASE Category
 Soifer, B. T. HQ-EL/Rahe, J. 11-Astronomy

NAGW 1741 California Institute of Technology 1554
 Ignis origins for the sodium cloud of IO
Period Obligations
 01/01/89-12/31/89 FY89: \$15,000 TOTAL: \$15,000
Prin. Invest. NASA Tech. Officer CASE Category
 Burnett, D. S. HQ-EL/Underwood, J. R. 32-Geological Sci

NAGW 1808 California Institute of Technology 1555
 Submillimeter and millimeter observations of solar system objects
Period Obligations
 10/01/89-09/30/90 FY89: \$66,000 TOTAL: \$66,000
Prin. Invest. NASA Tech. Officer CASE Category
 Muhleman, D. O. HQ-EL/Rahe, J. H. 11-Astronomy

NAS 5-25451 California Institute of Technology 1556
 Wide field/planetary camera for space telescope
Period Obligations
 01/01/79-01/31/90 FY89: \$1,109,000 TOTAL: \$14,429,586
Prin. Invest. NASA Tech. Officer CASE Category
 Westphal, J. GSFC/Stich, K. 11-Astronomy

NAS 5-27269 California Institute of Technology 1557
 Definition phase of the science program for a photometric filtergraph for the solar optical telescope (SOT)
Period Obligations
 05/26/82-10/31/89 FY89: \$323,000 TOTAL: \$1,501,637
Prin. Invest. NASA Tech. Officer CASE Category
 Zirin, H. GSFC/Comberiate, M. 31-Atmos Sci

NAS 5-30340 California Institute of Technology 1558
 Phase a study of an advanced composition Explorer mission
Period Obligations
 06/09/88-07/02/89 FY89: \$206,362 TOTAL: \$406,362
Prin. Invest. NASA Tech. Officer CASE Category
 Stone, E. C. GSFC/Mercanti, E. 11-Astronomy

NASA'S UNIVERSITY PROGRAM **CALIFORNIA (Continued)**

NASW 3983 California Institute of Technology 1559
 Millimeter spect/radiometer instrument development
Period Obligations
 11/15/84-12/31/88 FY89: TOTAL: \$820,272
Prin. Invest. NASA Tech. Officer CASE Category
 Muhleman, D. O. HQ-EL/Vescelus, F. 19-Phys Sci, NEC
 HQ-EL/Quaide, W. L.

NGL 05-002-105 California Institute of Technology 1567
 Shock effects in minerals
Period Obligations
 08/16/68-09/30/89 FY89: \$175,000 TOTAL: \$2,845,593
Prin. Invest. NASA Tech. Officer CASE Category
 Ahrens, T. J. HQ-EL/Underwood, J. 32-Geological Sci
 Rust, W. D. HQ-EL/Boyce, J. M.
 Sasaki, Y.

NCA 2-90 California Institute of Technology 1560
 Three-dimensional vortex methods for flow simulation
Period Obligations
 11/15/85-11/14/87 FY89: TOTAL: \$47,635
Prin. Invest. NASA Tech. Officer CASE Category
 Leonard, A. ARC/Mansour, N. 41-Aero Engr

NGL 05-002-140 California Institute of Technology 1568
 Research in planetary astronomy
Period Obligations
 04/11/69-12/31/89 FY89: TOTAL: \$952,303
Prin. Invest. NASA Tech. Officer CASE Category
 Soifer, B. T. HQ-EL/Brinton, H. C. 11-Astronomy
 HQ-EL/Rahe, J. H.

NCC 2-309 California Institute of Technology 1561
 Examination of the effects of vortex breakdown on high angle of attack aerodynamics
Period Obligations
 07/01/84-07/31/89 FY89: TOTAL: \$60,000
Prin. Invest. NASA Tech. Officer CASE Category
 Culick, F. E. ARC/Schiff, L. B. 41-Aero Engr

NGR 05-002-114 California Institute of Technology 1569
 Radio interferometry of Mars and Venus
Period Obligations
 10/11/68-09/30/89 FY89: \$35,000 TOTAL: \$840,129
Prin. Invest. NASA Tech. Officer CASE Category
 Muhleman, D. O. HQ-EL/Brinton, H. C. 11-Astronomy
 HQ-EL/Rahe, J. H.

NCC 2-429 California Institute of Technology 1562
 Application of bifurcation theory to the dynamics of flight at high angles of attack
Period Obligations
 09/01/86-12/31/89 FY89: TOTAL: \$90,000
Prin. Invest. NASA Tech. Officer CASE Category
 Culick, F. ARC/Gera, J. 41-Aero Engr
 Jahnke, C. ARC/Enevaldsen, E. K.

NGR 05-002-160 California Institute of Technology 1570
 Research in particles and fields
Period Obligations
 10/27/69-09/30/89 FY89: \$833,638 TOTAL: \$9,760,502
Prin. Invest. NASA Tech. Officer CASE Category
 Stone, E. C. HQ-ES/Mellott, M. M. 11-Astronomy
 HQ-EZ/Kaluzienski, L. J.

NCC 2-477 California Institute of Technology 1563
 Modeling analysis and identification of uncertain systems
Period Obligations
 05/01/87-04/30/90 FY89: \$104,999 TOTAL: \$296,183
Prin. Invest. NASA Tech. Officer CASE Category
 Doyle, J. C. ARC/Brenner, M. J. 41-Aero Engr
 Sideris, A. ARC/Burken, J. J.

NGT 00-050-092 California Institute of Technology 1571
 NASA graduate student researchers program
Period Obligations
 06/01/86-05/31/89 FY89: TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
 Prince, T. A. HQ-LE/Owens, F. C. 13-Physics

NCC 2-600 California Institute of Technology 1564
 Capillary phenomena at low and zero gravity
Period Obligations
 03/01/89-02/28/90 FY89: \$27,300 TOTAL: \$27,300
Prin. Invest. NASA Tech. Officer CASE Category
 Coles, D. ARC/Bahrami, P. A. 19-Phys Sci, NEC

NGT 00-050-093 California Institute of Technology 1572
 NASA graduate student researchers program
Period Obligations
 06/01/86-05/31/89 FY89: TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
 Doyle, J. C. HQ-LE/Owens, F. C. 41-Aero Engr

NGL 05-002-003 California Institute of Technology 1565
 Basic scientific research on lunar and planetary exploration
Period Obligations
 12/01/59-05/31/89 FY89: TOTAL: \$4,666,177
Prin. Invest. NASA Tech. Officer CASE Category
 Muhleman, D. O. HQ-EL/Brinton, H. C. 11-Astronomy
 HQ-EL/Rahe, J. H.

NGT 00-050-096 California Institute of Technology 1573
 NASA graduate student researchers program
Period Obligations
 06/01/86-06/30/88 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
 Murray, B. HQ-LE/Owens, F. C. 32-Geological Sci

NGL 05-002-034 California Institute of Technology 1566
 Research in solar flares and the solar atmosphere
Period Obligations
 05/18/65-10/31/89 FY89: \$260,000 TOTAL: \$5,156,066
Prin. Invest. NASA Tech. Officer CASE Category
 Zirin, H. HQ-ES/Bohlin, J. D. 13-Physics
 HQ-ES/Kane, S.

NGT 00-050-170 California Institute of Technology 1574
 NASA graduate student researchers program
Period Obligations
 07/01/87-06/30/89 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
 McKoy, V. HQ-XE/Owens, F. C. 12-Chemistry

NASA'S UNIVERSITY PROGRAM CALIFORNIA (Continued)

NGT 00-050-187 California Institute of Technology 1575
NASA graduate student researchers program
Period Obligations
06/01/87-05/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Libbrecht, K. G. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-227 California Institute of Technology 1576
NASA graduate student researchers program
Period Obligations
07/01/87-06/30/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Yung, Y. HQ-XE/Owens, F. C. 99-Multi-Discip

NGT 00-050-394 California Institute of Technology 1577
NASA graduate student researchers program
Period Obligations
09/01/88-08/31/90 FY89: \$36,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Scoville, N. Z. HQ-XE/Owens, F. C. 11-Astronomy

NGT 00-050-429 California Institute of Technology 1578
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Phillips, T. G. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-471 California Institute of Technology 1579
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Burnett, D. S. HQ-XE/Owens, F. C. 32-Geological Sci

NGT 00-050-501 California Institute of Technology 1580
NASA graduate student researchers program
Period Obligations
08/01/89-07/31/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Stolper, E. M. HQ-XE/Owens, F. C. 12-Chemistry

NGT 05-002-802 California Institute of Technology 1581
NASA graduate student researchers program
Period Obligations
06/01/85-05/31/88 FY89: TOTAL: \$48,744
Prin. Invest. NASA Tech. Officer CASE Category
Lewis, J. S. HQ-LE/Owens, F. C. 13-Physics

NGT 05-003-790 California Institute of Technology 1582
Summer research program faculty fellowships
Period Obligations
01/01/79-03/31/90 FY89: \$293,663 TOTAL: \$2,708,313
Prin. Invest. NASA Tech. Officer CASE Category
Albee, A. L. HQ-XE/McGee, A. S. 49-Engr, NEC
HQ-XE/Schwartz, E. T.

NSG 1483 California Institute of Technology 1583
Collapse and failure modes in advanced composite structures
Period Obligations
01/15/78-04/14/90 FY89: \$69,996 TOTAL: \$649,193
Prin. Invest. NASA Tech. Officer CASE Category
Knauss, W. G. LARC/Starnes, J. H. 41-Aero Engr
Babcock, C. D.

NSG 7129 California Institute of Technology 1584
Relationship of impact cratering to the evolution of the lunar surface
Period Obligations
04/01/75-09/30/89 FY89: \$60,000 TOTAL: \$986,221
Prin. Invest. NASA Tech. Officer CASE Category
Ahrens, T. J. HQ-EL/Underwood, J. R. 32-Geological Sci
HQ-EL/Boyce, J. M.

NSG 7376 California Institute of Technology 1585
Photochemistry of the Jovian planets and their satellites
Period Obligations
11/01/77-02/28/89 FY89: TOTAL: \$620,049
Prin. Invest. NASA Tech. Officer CASE Category
Yung, Y. L. HQ-EL/Fix, K. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NAGW 715 California St. Polytechnic U-Pomona 1586
Periglacial and glacial analogs for Martian landforms
Period Obligations
01/01/85-12/30/90 FY89: TOTAL: \$33,324
Prin. Invest. NASA Tech. Officer CASE Category
Rossbacher, L. A. HQ-EL/Scott, D. H. 32-Geological Sci
HQ-EL/Boyce, J. M.

NAG 2-375 California Polytechnic State U-San Luis 1587
Economical graphics display system for flight simulation avionics
Period Obligations
10/01/85-09/30/89 FY89: \$29,573 TOTAL: \$119,613
Prin. Invest. NASA Tech. Officer CASE Category
Fitzpatrick, M. ARC/Totah, J. J. 41-Aero Engr
ARC/Jones, A. D.

NAG 2-559 California Polytechnic State U-San Luis 1588
Design and evaluation of thrust vectored nozzles using a multicomponent thrust stand
Period Obligations
10/01/88-12/31/89 FY89: \$24,076 TOTAL: \$24,076
Prin. Invest. NASA Tech. Officer CASE Category
Carpenter, T. W. ARC/Johnson, S. A. 41-Aero Engr
ARC/Ray, R. J.

NAS 2-10364 California Polytechnic State U-San Luis 1589
Software development and application for dynamic analysis of the tilt rotor research aircraft
Period Obligations
09/04/79-09/01/89 FY89: TOTAL: \$392,827
Prin. Invest. NASA Tech. Officer CASE Category
Grimes, J. E. ARC/Magee, J. P. 41-Aero Engr

NCA 2-212 California Polytechnic State U-San Luis 1590
Metric conservation for time dependent grds using a finite difference approach
Period Obligations
06/22/87-12/31/88 FY89: TOTAL: \$15,000
Prin. Invest. NASA Tech. Officer CASE Category
Cummings, R. ARC/Chaderjian, N. M. 41-Aero Engr

NCC 2-226 California Polytechnic State U-San Luis 1591
Validation of an existing panelling method
Period Obligations
10/01/82-06/30/89 FY89: TOTAL: \$100,606
Prin. Invest. NASA Tech. Officer CASE Category
Hoffman, J. A. ARC/Corsiglia, V. R. 41-Aero Engr

**NASA'S UNIVERSITY PROGRAM
CALIFORNIA (Continued)**

NCC 2-236 California Polytechnic State U-San Luis 1592
Use of the ACSYNT program for the preliminary investigation of selected aircraft

Period	FY89:	Obligations	TOTAL:
01/01/83-09/30/89			\$133,234
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hoffmann, J. A.	ARC/Gelhausen, P. A.	41-Aero Engr	

NCC 2-433 California Polytechnic State U-San Luis 1593
Thermal analysis of an isolated bay of a hypersonic wing test structure

Period	FY89:	Obligations	TOTAL:
09/01/86-09/30/88			\$36,153
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hoffmann, J.	ARC/Gong, L.	41-Aero Engr	
Swanson, N. J.			

NCC 2-467 California Polytechnic State U-San Luis 1594
Maneuver effects related to performance of aircraft

Period	FY89:	Obligations	TOTAL:
04/01/87-09/30/89			\$23,022
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Carpenter, T. W.	ARC/Hicks, J. W.	41-Aero Engr	

NCC 2-468 California Polytechnic State U-San Luis 1595
An analysis of flight test performance data and a comparison with digital performance simulation results

Period	FY89:	Obligations	TOTAL:
04/01/87-09/30/89			\$22,133
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Carpenter, T. W.	ARC/Ray, R. J.	41-Aero Engr	
	ARC/Hicks, J. W.		

NCC 2-484 California Polytechnic State U-San Luis 1596
Development of a system for basic fluid mechanics measurements

Period	FY89:	Obligations	TOTAL:
07/01/87-04/30/89			\$36,714
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hoffmann, J. A.	ARC/Olson, L. E.	41-Aero Engr	
	ARC/Horne, W. C.		

NCC 2-533 California Polytechnic State U-San Luis 1597
An improved digital performance simulation program for analysis of flight test performance

Period	FY89:	Obligations	TOTAL:
04/01/88-10/31/89	\$17,862		\$32,862
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Carpenter, T. W.	ARC/Ray, R. J.	41-Aero Engr	
	ARC/Hicks, J. W.		

NCC 2-536 California Polytechnic State U-San Luis 1598
Computation of three dimensional effects on two dimensional wings

Period	FY89:	Obligations	TOTAL:
06/01/88-11/30/89	\$20,085		\$34,085
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Cummings, R. M.	ARC/Ross, J. C.	41-Aero Engr	

NCC 2-564 California Polytechnic State U-San Luis 1599
Three dimensional separated flow about geometrically simple bodies

Period	FY89:	Obligations	TOTAL:
07/01/88-12/31/89	\$34,138		\$34,138
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Cummings, R. M.	ARC/Schiff, L. B.	41-Aero Engr	

NCC 2-586 California Polytechnic State U-San Luis 1600
Evaluation of single and dual exhaust vectored nozzles to enhance aircraft maneuverability

Period	FY89:	Obligations	TOTAL:
03/01/89-02/28/90	\$26,243		\$26,243
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Carpenter, T. W.	ARC/Ray, R.	41-Aero Engr	
Peron, L.	ARC/Bowers, A. H.		

NCC 2-620 California Polytechnic State U-San Luis 1601
Water tunnel study on the F 18 aircraft

Period	FY89:	Obligations	TOTAL:
07/01/89-03/31/90	\$18,402		\$18,402
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Sandlin, D. R.	ARC/Arnaiz, H. H.	41-Aero Engr	
Ramirez, E. J.	ARC/Del Frate, J. H.		

NAGW 1700 California State University - Fresno 1602
Global monitoring of vector-borne diseases

Period	FY89:	Obligations	TOTAL:
02/01/89-01/31/90	\$75,000		\$75,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Paris, J. F.	HQ-EB/Averner, M.	51-Biological Sci	

NAG 9-57 California State University - Fullerton 1603
Meteoritic trace element microdistributions

Period	FY89:	Obligations	TOTAL:
03/01/83-03/01/90	\$16,000		\$266,010
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Woolum, D. S.	JSC/Browne, I. D.	13-Physics	

NSG 7614 California State University - Fullerton 1604
Atmospheric dynamics from Viking Lander data

Period	FY89:	Obligations	TOTAL:
08/01/79-04/30/89			\$106,739
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Ryan, J. A.	HQ-EL/Brinton, H. C.	31-Atmos Sci	
	HQ-EL/Brunk, W. E.		

NCC 2-529 California State Univ.- hayward 1605
Analysis of the visual framework effect

Period	FY89:	Obligations	TOTAL:
02/01/88-02/28/90	\$49,745		\$99,557
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Stoper, A. E.	ARC/Cohen, M. M.	69-Psych, NEC	

NAG 2-569 California State University - Long Beach 1606
An unsteady boundary layer method to improve the Euler solutions

Period	FY89:	Obligations	TOTAL:
01/01/89-10/31/89	\$30,800		\$30,800
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Cebeci, T.	ARC/Petersen, K. L.	41-Aero Engr	
	ARC/Gupta, K. K.		

NAG 3-20 California State University - Long Beach 1607
Gear lubrication and cooling study

Period	FY89:	Obligations	TOTAL:
01/01/80-12/08/89			\$362,232
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Akin, L.	LERC/Townsend, D. P.	46-Mech Engr	
El-bayoumy, L.			

NASA'S UNIVERSITY PROGRAM CALIFORNIA (Continued)

NAG 3-601 California State University - Long Beach 1608

Iced airfoil flowfield analysis

Period	Obligations	
01/05/85-01/01/89	FY89: TOTAL: \$208,694	
Prin. Invest.	NASA Tech. Officer	CASE Category
Cebeci, T.	LERC/Bidwell, C.	41-Aero Engr

NAG 3-935 California State University - Long Beach 1609

Ice accretion prediction code

Period	Obligations	
10/01/88-09/30/89	FY89: \$57,341 TOTAL: \$96,758	
Prin. Invest.	NASA Tech. Officer	CASE Category
Cebeci, T.	LERC/Bidwell, C. S.	41-Aero Engr

NAG 3-1050 California State University - Long Beach 1610

Calculation of flow over swept wings with ice

Period	Obligations	
06/01/89-05/31/90	FY89: \$61,070 TOTAL: \$61,070	
Prin. Invest.	NASA Tech. Officer	CASE Category
Cebeci, T.	LERC/Bidwell, C. S.	41-Aero Engr

NAG 2-499 California State University - Northridge 1611

Embryonic development in space a model system mechanisms of cellular adhesion

Period	Obligations	
10/01/87-09/30/88	FY89: TOTAL: \$4,350	
Prin. Invest.	NASA Tech. Officer	CASE Category
Oppenheimer, S. B.	ARC/Ross, M. D.	51-Biological Sci
	ARC/Holton, E.	

NAG 5-1219 California State University - Northridge 1612

Collection and analysis of photometric data in support of the Solar Maximum Mission (SMM)

Period	Obligations	
08/15/89-08/14/90	FY89: \$37,836 TOTAL: \$37,836	
Prin. Invest.	NASA Tech. Officer	CASE Category
Chapman, G. A.	GSFC/Bullock, G. D.	19-Phys Sci, NEC

NAGW 688 California State University - Northridge 1613

Operation of a rotating full disk photometer in support of the SMM

Period	Obligations	
12/01/84-08/31/89	FY89: TOTAL: \$107,104	
Prin. Invest.	NASA Tech. Officer	CASE Category
Chapman, G. A.	HQ-EZ/Ahluwalia, H. S.	13-Physics

NCC 2-515 California State University - Northridge 1614

Efficient grid generation and its application

Period	Obligations	
08/01/87-09/30/89	FY89: \$13,896 TOTAL: \$26,896	
Prin. Invest.	NASA Tech. Officer	CASE Category
Seki, R.	ARC/Steger, J. L.	29-Math/Computer, NEC
	ARC/Holst, T. L.	

NGT 00-070-075 California State University - Northridge 1615

NASA graduate student researchers underrepresented minority focus program

Period	Obligations	
08/01/87-07/31/89	FY89: \$18,000 TOTAL: \$36,000	
Prin. Invest.	NASA Tech. Officer	CASE Category
Seki, R.	HQ-XE/Owens, F. C.	13-Physics

NGT 00-070-085 California State University - Northridge 1616

NASA graduate student researchers underrepresented minority focus program

Period	Obligations	
05/16/88-05/15/90	FY89: \$18,000 TOTAL: \$36,000	
Prin. Invest.	NASA Tech. Officer	CASE Category
Oppenheimer, S. B.	HQ-XE/Owens, F. C.	51-Biological Sci

NGT 00-070-152 California State University - Northridge 1617

NASA graduate student researchers underrepresented minority focus program

Period	Obligations	
07/01/89-06/30/90	FY89: \$18,000 TOTAL: \$18,000	
Prin. Invest.	NASA Tech. Officer	CASE Category
Seki, R.	HQ-XE/Owens, F. C.	13-Physics

NCC 2-342 Foothill-De Anza Com College System Off 1618

Optimization of knowledge based systems and expert system development tools

Period	Obligations	
01/01/85-12/31/89	FY89: \$66,204 TOTAL: \$837,101	
Prin. Invest.	NASA Tech. Officer	CASE Category
Frederick, V.	ARC/Lum, H.	22-Computer Science
	LERC/McKellar, D.	

NCA 2-292 Harvey Mudd College 1619

In flight aeroelastic stability parameter estimation

Period	Obligations	
02/01/88-06/30/88	FY89: TOTAL: \$28,000	
Prin. Invest.	NASA Tech. Officer	CASE Category
Krieger, H.	ARC/Kehoe, M. W.	21-Mathematics
Borrelli, R. L.		

NCA 2-359 Harvey Mudd College 1620

An algorithm for real time flutter identification

Period	Obligations	
10/03/88-06/30/89	FY89: \$28,000 TOTAL: \$28,000	
Prin. Invest.	NASA Tech. Officer	CASE Category
Coleman, C.	ARC/Kehoe, M. W.	21-Mathematics
Borrelli, R. L.		

NCA 2-237 Humboldt State University 1621

Research on telecommunications circuit planning tools

Period	Obligations	
07/10/87-07/09/89	FY89: TOTAL: \$40,002	
Prin. Invest.	NASA Tech. Officer	CASE Category
Blaisdell, J. H.	ARC/Jones, W. P.	22-Computer Science

NCC 2-639 Humboldt State University 1622

Decision support issues in an experimental database for network project management

Period	Obligations	
08/15/89-08/14/90	FY89: \$94,596 TOTAL: \$94,596	
Prin. Invest.	NASA Tech. Officer	CASE Category
Blaisdell, J. H.	ARC/Jones, W. P.	22-Computer Science
	ARC/Siegel, M. R.	

NGT 00-050-275 Humboldt State University 1623

NASA graduate student researchers program

Period	Obligations	
08/01/88-07/31/89	FY89: TOTAL: \$18,000	
Prin. Invest.	NASA Tech. Officer	CASE Category
Burke, R. M.	HQ-EE/Baltuck, M.	32-Geological Sci
Herrick, J. F.	HQ-EE/Ruzek, M.	

NASA'S UNIVERSITY PROGRAM CALIFORNIA (Continued)

NGT 00-050-508 Humboldt State University 1624
NASA graduate student researchers program
Period *Obligations*
08/01/89-07/31/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Burke, R. HQ-EE/Ruzek, M. 99-Multi-Discip
Fischer, A. HQ-EE/Baltuck, M.

NAG 9-273 Northrop University 1625
Research and experimental determination of thermal conductivity
Period *Obligations*
04/01/88-12/01/89 FY89: TOTAL: \$17,640
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Maddox, A. JSC/Van Tassel, K. 12-Chemistry

NAG 5-1011 Pitzer College 1626
Properties of gamma ray bursts detected by the gamma ray spectrometer
Period *Obligations*
10/01/87-03/31/90 FY89: \$30,000 TOTAL: \$59,900
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Higdon, J. C. GSFC/Bullock, G. D. 19-Phys Sci, NEC
GSFC/Gurman, J. B.

NAGW 1297 Pitzer College 1627
A systematic investigation of turbulent density magnetic field and velocity fluctuations in the interplanetary medium
Period *Obligations*
05/01/88-11/30/89 FY89: TOTAL: \$20,250
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Higdon, J. C. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Jones, W. V.

NAG 5-911 San Diego State University 1628
Measurement of evapotranspiration with combined reflective and thermal infrared radiance observations
Period *Obligations*
06/15/87-01/31/90 FY89: \$75,000 TOTAL: \$193,170
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hope, A. S. GSFC/Choudhury, B. 39-Env Sci, NEC
GSFC/Hall, F.

NAGW 230 San Diego State University 1629
Mechanism of geotropic curvature in plant shoots
Period *Obligations*
07/01/81-10/31/88 FY89: TOTAL: \$264,383
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Rayle, D. HQ-EB/Halstead, T. W. 51-Biological Sci

NAGW 319 San Diego State University 1630
Photoabsorption and photodissociation of molecules important in the interstellar medium
Period *Obligations*
05/15/82-01/14/90 FY89: \$79,600 TOTAL: \$512,294
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lee, L. HQ-EZ/Gillett, F. C. 11-Astronomy
HQ-EZ/Weiler, E. J.

NAS13-373 San Diego State University 1631
Efficient updates of vector coded geographic information systems using remotely sensed data
Period *Obligations*
09/30/88-09/30/90 FY89: \$39,000 TOTAL: \$244,781
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Stow, D. A. SSC/Hill, C. L. 39-Env Sci, NEC

NCC 2-458 San Diego State University 1632
Application of panel methods to V STOL and slender body aerodynamics
Period *Obligations*
10/01/86-06/30/90 FY89: \$20,000 TOTAL: \$157,288
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Katz, J. ARC/Olson, L. E. 41-Aero Engr
ARC/Corsiglia, V. R.

NCC 2-596 San Diego State University 1633
Applications of panel methods to VSTOL and slender body aerodynamics
Period *Obligations*
10/01/88-10/31/89 FY89: \$35,000 TOTAL: \$35,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Katz, J. ARC/Olson, L. E. 41-Aero Engr
ARC/Corsiglia, V. R.

NCA 2-175 San Francisco State University 1634
Operation of the NASA Ames university consortium joint enterprise offices
Period *Obligations*
11/01/86-03/31/88 FY89: \$14,392 TOTAL: \$204,505
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Heidtmann, R. W. ARC/Milov, L. A. 99-Multi-Discip
Giles, E. C.
Inadomi, E.

NCA 2-188 San Francisco State University 1635
Work engagement plan for combining and dedicating certain resources of the CO adventurers for displaying at the technology market center in Santa Clara County information concerning
Period *Obligations*
12/23/86-09/30/88 FY89: \$386,500 TOTAL: \$658,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Cunningham, A. F. ARC/Milov, L. A. 99-Multi-Discip

NCA 2-261 San Francisco State University 1636
Radiative transfer studies in planetary atmospheres
Period *Obligations*
10/01/87-09/30/89 FY89: TOTAL: \$65,208
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Marcy, G. W. ARC/Valero, F. P. 11-Astronomy

NCA 2-267 San Francisco State University 1637
Joint use of resources for operation of the NASA Ames university consortium office
Period *Obligations*
11/01/87-03/31/89 FY89: TOTAL: \$112,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Greenaway, L. B. ARC/Milov, L. A. 99-Multi-Discip
Steger, E. C.

NCA 2-364 San Francisco State University 1638
Joint use of resources for operation of ARC university consortium office
Period *Obligations*
01/01/89-03/31/89 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Greenaway, L. ARC/Milov, L. 99-Multi-Discip
Steger, E. C.

NCA 2-444 San Francisco State University 1639
Modeling of planetary surface mineralogy joint research interchange
Period *Obligations*
09/01/89-11/30/89 FY89: \$14,319 TOTAL: \$14,319
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Orenberg, J. ARC/Pollack, J. 12-Chemistry

**NASA'S UNIVERSITY PROGRAM
CALIFORNIA (Continued)**

NCA 2-454 San Francisco State University 1640
Aircraft-satellite intercomparison study
Period *Obligations*
10/01/89-09/30/91 FY89: \$38,100 TOTAL: \$38,100
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Marcy, G. ARC/Valero, F. P. 13-Physics

NCC 2-352 San Francisco State University 1641
The spectroscopic chemical and photophysical properties of Martian soils and their analogs
Period *Obligations*
04/01/85-01/14/90 FY89: \$57,430 TOTAL: \$360,930
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Banin, A. ARC/Carle, G. C. 59-Life Sci, NEC

NAG 2-363 San Jose State University 1642
AOTV shock tunnel simulations
Period *Obligations*
10/01/85-10/31/89 FY89: TOTAL: \$141,101
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Desautel, D. ARC/Lasher, L. E. 41-Aero Engr

NAG 2-410 San Jose State University 1643
Proteolysis in muscle atrophy
Period *Obligations*
04/15/86-09/30/89 FY89: \$5,000 TOTAL: \$147,473
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Yengoyan, L. S. ARC/Grindeland, R. E. 51-Biological Sci

NAG 2-457 San Jose State University 1644
Aerodynamic maneuvering hypersonic flight mechanics
Period *Obligations*
06/01/87-09/30/88 FY89: TOTAL: \$13,745
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Desautel, D. ARC/Tauber, M. E. 41-Aero Engr

NAG 2-537 San Jose State University 1645
Incorporation of meteorological information into air traffic control automation
Period *Obligations*
09/01/88-08/31/90 FY89: \$173,003 TOTAL: \$173,003
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Nedell, W. F. ARC/Davis, T. J. 41-Aero Engr
ARC/Erzberger, H.

NAG 2-594 San Jose State University 1646
Cosmos 89 pineal physiology in microgravity relation to gonadal function
Period *Obligations*
06/01/89-09/30/89 FY89: \$10,000 TOTAL: \$10,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Holley, D. ARC/Ballard, R. 51-Biological Sci

NAG 5-1273 San Jose State University 1647
Research relative to gamma-ray emission from the lunar surface
Period *Obligations*
10/01/89-04/30/90 FY89: \$10,000 TOTAL: \$10,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Englert, P. A. GSFC/Trombka, J. I. 19-Phys Sci, NEC

NAG 9-232 San Jose State University 1648
Cosmogenic nuclide production in meteorites
Period *Obligations*
08/01/87-08/01/90 FY89: \$43,000 TOTAL: \$123,969
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Englert, P. A. JSC/Browne, I. D. 32-Geological Sci

NCA 2-145 San Jose State University 1649
Canopy biochemistry in Douglas fir forest
Period *Obligations*
09/01/86-08/31/88 FY89: TOTAL: \$35,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Savage, W. ARC/Matson, P. 54-Env Biology

NCA 2-203 San Jose State University 1650
Characterization and validation of the photo environment within the animal rat housing modules to be used in microgravity
Period *Obligations*
04/01/87-03/31/89 FY89: TOTAL: \$25,174
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Holley, D. C. ARC/Winget, C. M. 51-Biological Sci
ARC/Leon, H.

NCA 2-218 San Jose State University 1651
Development of an IR laser gas analysis technique for use in planetary isotopic ratio measurements
Period *Obligations*
06/01/87-05/31/89 FY89: \$34,000 TOTAL: \$80,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Becker, J. F. ARC/McKay, C. P. 13-Physics

NCA 2-220 San Jose State University 1652
A modeling study of the climate effects of arctic hase
Period *Obligations*
06/01/87-08/20/89 FY89: \$16,193 TOTAL: \$28,519
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bornstein, R. D. ARC/Haberle, R. M. 31-Atmos Sci
ARC/Ackerman, T.

NCA 2-295 San Jose State University 1653
San Jose State University NASA Ames Research Center research and development program
Period *Obligations*
04/15/88-04/30/90 FY89: \$1,188,630 TOTAL: \$1,935,839
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Freeman, J. ARC/Pike, R. L. 99-Multi-Discip
ARC/Cunningham, D.

NCA 2-356 San Jose State University 1654
Survival of carbonaceous grains in a simulated solar nebula
Period *Obligations*
10/24/88-10/24/89 FY89: \$2,000 TOTAL: \$2,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Becker, J. F. ARC/Chang, S. 13-Physics
Tomley, L. ARC/Cassen, M.

NCA 2-382 San Jose State University 1655
Evolution of chemical species in laser induced plasma and associated shock waves
Period *Obligations*
01/15/89-01/14/90 FY89: \$10,000 TOTAL: \$10,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lakkaraju, H. S. ARC/Borucki, W. J. 13-Physics
ARC/McKay, C. P.

NASA'S UNIVERSITY PROGRAM **CALIFORNIA (Continued)**

NCA 2-386 San Jose State University 1656
 A study of polar stratospheric clouds
Period Obligations
 02/01/89-01/31/91 FY89: \$29,743 TOTAL: \$29,743
Prin. Invest. NASA Tech. Officer CASE Category
 Hamill, P. ARC/Toon, O. B. 13-Physics

NCC 2-168 San Jose State University 1664
 Experimental studies of the distribution of minor constituents
Period Obligations
 01/01/82-10/31/89 FY89: \$139,876 TOTAL: \$671,687
Prin. Invest. NASA Tech. Officer CASE Category
 Goodman, J. ARC/Vedder, J. F. 31-Atmos Sci

NCA 2-388 San Jose State University 1657
 Joint use of resources for operation of the NASA Ames university consortium office
Period Obligations
 04/01/89-10/31/89 FY89: \$72,000 TOTAL: \$72,000
Prin. Invest. NASA Tech. Officer CASE Category
 Garrison, S. E. ARC/Milov, L. A. 99-Multi-Discip
 Steger, E. C.

NCC 2-195 San Jose State University 1665
 Development of analytical techniques for the analysis of fiber materials
Period Obligations
 08/01/82-05/31/90 FY89: \$72,240 TOTAL: \$408,014
Prin. Invest. NASA Tech. Officer CASE Category
 Anderson, R. N. ARC/Riccitiello, S. R. 47-Materials Engr
 ARC/Leiser, D.

NCA 2-407 San Jose State University 1658
 Applications of stable isotope ratio measurements using tunable diode lasers
Period Obligations
 06/01/89-05/31/91 FY89: \$28,000 TOTAL: \$28,000
Prin. Invest. NASA Tech. Officer CASE Category
 Becker, J. ARC/Valentin, J. 13-Physics

NCC 2-211 San Jose State University 1666
 Tropospheric stratospheric measurement studies
Period Obligations
 09/22/82-10/31/89 FY89: \$82,447 TOTAL: \$463,834
Prin. Invest. NASA Tech. Officer CASE Category
 Goodman, J. ARC/Chan, K. R. 31-Atmos Sci
 Bowen, S. W. ARC/Scott, S. G.

NCA 2-427 San Jose State University 1659
 The oxidation and degradation of organic compounds under simulated Martian conditions
Period Obligations
 07/17/89-07/16/91 FY89: \$15,000 TOTAL: \$15,000
Prin. Invest. NASA Tech. Officer CASE Category
 Becker, J. F. ARC/Stoker, C. 12-Chemistry

NCC 2-267 San Jose State University 1667
 Development of digital flight control laws and a flight control computer system for RSRA rotor performance research
Period Obligations
 08/22/83-01/31/90 FY89: TOTAL: \$710,380
Prin. Invest. NASA Tech. Officer CASE Category
 Wang, J. C. ARC/Talbot, P. D. 41-Aero Engr
 ARC/Snyder, W.

NCA 2-438 San Jose State University 1660
 The analysis and visualization of potential energy surfaces
Period Obligations
 07/01/89-12/31/90 FY89: \$34,453 TOTAL: \$34,453
Prin. Invest. NASA Tech. Officer CASE Category
 Morris, H. ARC/Jaffe, R. 21-Mathematics
 Motte, D.

NCC 2-315 San Jose State University 1668
 An investigation of clear air turbulence (CAT) incidents involving wide-bodied aircraft
Period Obligations
 06/15/84-10/14/89 FY89: \$30,893 TOTAL: \$134,918
Prin. Invest. NASA Tech. Officer CASE Category
 Lester, P. F. ARC/Wingrove, R. C. 31-Atmos Sci
 ARC/Bach, R. E.

NCC 2-3 San Jose State University 1661
 A study of fiber materials for use in temperature resistant fiber reinforced composites
Period Obligations
 05/31/79-05/31/90 FY89: \$31,248 TOTAL: \$528,903
Prin. Invest. NASA Tech. Officer CASE Category
 Anderson, R. N. ARC/Riccitiello, S. R. 47-Materials Engr
 ARC/Goldstein, H.

NCC 2-327 San Jose State University 1669
 Aero-space human factors
Period Obligations
 10/01/84-10/31/89 FY89: \$814,882 TOTAL: \$2,363,614
Prin. Invest. NASA Tech. Officer CASE Category
 Jordan, K. ARC/Shaffo, M. G. 69-Psych, NEC
 ARC/Chambers, A. B.

NCC 2-153 San Jose State University 1662
 Energetic contributions of the mineral phase to chemistry on planetary surfaces
Period Obligations
 07/01/81-10/31/89 FY89: \$84,734 TOTAL: \$605,176
Prin. Invest. NASA Tech. Officer CASE Category
 Ling, A. C. ARC/Chang, S. 12-Chemistry
 Coyne, L. M. ARC/Lawless, J.

NCC 2-345 San Jose State University 1670
 The spectroscopic, chemical and photophysical properties of Martian soils and their analogs
Period Obligations
 03/01/85-06/30/89 FY89: \$61,270 TOTAL: \$261,141
Prin. Invest. NASA Tech. Officer CASE Category
 Ling, A. C. ARC/Carle, G. C. 59-Life Sci, NEC
 Coyne, L. M.

NCC 2-167 San Jose State University 1663
 Functional significance of sensory interactions in the vestibular system in relation to self motion perception and motion sickness
Period Obligations
 01/01/82-05/31/90 FY89: \$109,968 TOTAL: \$514,211
Prin. Invest. NASA Tech. Officer CASE Category
 Fox, R. A. ARC/Daunton, N. G. 51-Biological Sci
 ARC/Corcoran, M. L.

NCC 2-412 San Jose State University 1671
 Ballistic range and shock tunnel test engineering
Period Obligations
 05/01/86-02/28/89 FY89: TOTAL: \$88,497
Prin. Invest. NASA Tech. Officer CASE Category
 Desautel, D. ARC/Lasher, L. E. 41-Aero Engr

**NASA'S UNIVERSITY PROGRAM
CALIFORNIA (Continued)**

NCC 2-430	San Jose State University	1672	Flow field graphics <i>Period</i> 07/15/86-09/30/90 <i>Prin. Invest.</i> Borja, A. A. Desautel, D.	<i>Obligations</i> FY89: \$77,886 NASA Tech. Officer ARC/Deiwert, G. S. ARC/Feiereisen, W. J.	TOTAL: \$309,730 <i>CASE Category</i> 41-Aero Engr
NCC 2-449	San Jose State University	1673	Neural connectivity and immunocytochemical studies of anatomical sites related to nauseogenic and emetic reflexes <i>Period</i> 12/01/86-11/30/89 <i>Prin. Invest.</i> Fox, R. A. D'amilio, F.	<i>Obligations</i> FY89: \$156,147 NASA Tech. Officer ARC/Corcoran, M. L. ARC/Mehler, W. R.	TOTAL: \$422,377 <i>CASE Category</i> 51-Biological Sci
NCC 2-466	San Jose State University	1674	Planetary atmospheres associated with experiments on the Galileo-Jupiter probe experiments on the Venus balloons and infrared observations of Venus <i>Period</i> 03/01/87-12/31/89 <i>Prin. Invest.</i> Ragent, B. Goodman, J.	<i>Obligations</i> FY89: \$99,612 NASA Tech. Officer ARC/Brockner, D. H. ARC/Sperans, J.	TOTAL: \$227,913 <i>CASE Category</i> 19-Phys Sci, NEC
NCC 2-471	San Jose State University	1675	The atmosphere of Venus, and work on the atmospheric structure <i>Period</i> 04/01/87-03/31/90 <i>Prin. Invest.</i> Lester, P. Seiff, A.	<i>Obligations</i> FY89: \$99,773 NASA Tech. Officer ARC/Young, R. E.	TOTAL: \$251,730 <i>CASE Category</i> 31-Atmos Sci
NCC 2-527	San Jose State University	1676	Planetary atmospheres associated with the Pioneer-Venus orbiter and the Galileo probe to Jupiter <i>Period</i> 01/15/88-01/14/90 <i>Prin. Invest.</i> Colin, L. Lester, P. F.	<i>Obligations</i> FY89: \$72,259 NASA Tech. Officer ARC/Dyer, J. W. ARC/Fimmel, R. O.	TOTAL: \$135,960 <i>CASE Category</i> 19-Phys Sci, NEC
NCC 2-593	San Jose State University	1677	Lighting requirements for the animal rat housing modules to be used in microgravity <i>Period</i> 10/01/88-10/31/89 <i>Prin. Invest.</i> Holley, D. C.	<i>Obligations</i> FY89: \$19,936 NASA Tech. Officer ARC/Winget, C. M. ARC/Callahan, P. X.	TOTAL: \$19,936 <i>CASE Category</i> 51-Biological Sci
NCC 2-595	San Jose State University	1678	Multidimensional pattern recognition by neural networks <i>Period</i> 06/01/89-01/31/90 <i>Prin. Invest.</i> Wang, J. C.	<i>Obligations</i> FY89: \$31,250 NASA Tech. Officer ARC/Tobias, L. ARC/Bach, R.	TOTAL: \$31,250 <i>CASE Category</i> 29-Math/Cmputer, NEC
NCC 2-611	San Jose State University	1679	Muscle atrophy as related to growth hormone GH receptors <i>Period</i> 03/01/89-12/31/89 <i>Prin. Invest.</i> Yengoyan, L. S. Satyanarayana, T.	<i>Obligations</i> FY89: \$58,615 NASA Tech. Officer ARC/Grindeland, R. E.	TOTAL: \$58,615 <i>CASE Category</i> 51-Biological Sci
NCC 2-640	San Jose State University	1680	Path finder EVA suit project <i>Period</i> 09/01/89-04/30/90 <i>Prin. Invest.</i> Unwin, E. Magistao, J. Selvaduray, G.	<i>Obligations</i> FY89: \$65,000 NASA Tech. Officer ARC/Lomax, W. C. ARC/Reinhardt, A.	TOTAL: \$65,000 <i>CASE Category</i> 42-Astro Engr
NGT 00-070-068	San Jose State University	1681	Graduate student researchers underrepresented minority focus program <i>Period</i> 01/01/88-12/31/90 <i>Prin. Invest.</i> Yengoyan, L. S.	<i>Obligations</i> FY89: \$18,000 NASA Tech. Officer HQ-XE/Owens, F. C.	TOTAL: \$36,000 <i>CASE Category</i> 12-Chemistry
NGT 00-070-069	San Jose State University	1682	Graduate student researchers underrepresented minority focus program <i>Period</i> 01/01/88-06/30/90 <i>Prin. Invest.</i> Becker, J. F.	<i>Obligations</i> FY89: \$15,478 NASA Tech. Officer HQ-XE/Owens, F. C.	TOTAL: \$30,925 <i>CASE Category</i> 13-Physics
NGT 00-070-131	San Jose State University	1683	Graduate student researchers underrepresented minority focus program <i>Period</i> 09/01/89-08/31/90 <i>Prin. Invest.</i> Englert, P.	<i>Obligations</i> FY89: \$18,000 NASA Tech. Officer HQ-XE/Owens, F. C.	TOTAL: \$18,000 <i>CASE Category</i> 12-Chemistry
NGT 00-070-136	San Jose State University	1684	NASA graduate student researchers underrepresented minority focus program <i>Period</i> 07/01/89-06/30/90 <i>Prin. Invest.</i> Yengoyan, L. S.	<i>Obligations</i> FY89: \$18,000 NASA Tech. Officer HQ-XE/Owens, F. C.	TOTAL: \$18,000 <i>CASE Category</i> 12-Chemistry
NGT 00-070-137	San Jose State University	1685	NASA graduate student researchers underrepresented minority focus program <i>Period</i> 07/01/89-06/30/90 <i>Prin. Invest.</i> Fox, R. A.	<i>Obligations</i> FY89: \$17,086 NASA Tech. Officer HQ-XE/Owens, F. C.	TOTAL: \$17,086 <i>CASE Category</i> 51-Biological Sci
NAG 5-1260	Sonoma State University	1686	High time resolution studies of binary X-ray pulsars <i>Period</i> 09/01/89-01/31/90 <i>Prin. Invest.</i> Cominsky, L. R.	<i>Obligations</i> FY89: \$11,700 NASA Tech. Officer GSFC/West, D.	TOTAL: \$11,700 <i>CASE Category</i> 12-Chemistry

**NASA'S UNIVERSITY PROGRAM
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NAG 8-649 Sonoma State University 1687
Multi mission studies of massive X ray binaries
Period Obligations
06/24/87-06/24/90 FY89: TOTAL: \$52,983
Prin. Invest. NASA Tech. Officer CASE Category
Cominsky, L. R. MSFC/Harper, B. 11-Astronomy

NAG 1-851 Stanford University 1695
Research and development of HgInTe as an infrared material
Period Obligations
02/03/88-02/02/89 FY89: TOTAL: \$50,000
Prin. Invest. NASA Tech. Officer CASE Category
Spicer, W. E. LARC/Fripp, A. L. 13-Physics

NCC 2-356 So. Cal Institute of Architecture 1688
Space station group activities habitability module study
Period Obligations
09/01/87-02/28/89 FY89: \$12,765 TOTAL: \$141,995
Prin. Invest. NASA Tech. Officer CASE Category
Nixon, D. A. ARC/Cohen, M. M. 79-Soc Sci, NEC
Glassman, T. A. ARC/Clearwater, Y. C.

NAG 1-1052 Stanford University 1696
Aircraft design and optimization using a knowledge -based system
Period Obligations
06/20/89-06/19/90 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. NASA Tech. Officer CASE Category
Kroo, I. LARC/Rogers, J. L. 41-Aero Engr

NAG 1-182 Stanford University 1689
High energy efficient solid state laser sources
Period Obligations
06/01/81-09/30/88 FY89: TOTAL: \$588,582
Prin. Invest. NASA Tech. Officer CASE Category
Byer, R. L. LARC/Magee, C. J. 45-Elec Engr
LARC/Newcomb, A. L.

NAG 2-191 Stanford University 1697
Modeling and control of V/STOL aircraft
Period Obligations
08/15/82-03/31/90 FY89: TOTAL: \$295,000
Prin. Invest. NASA Tech. Officer CASE Category
Bryson, A. E. ARC/Erzberger, H. 41-Aero Engr
ARC/Denery, D.

NAG 1-361 Stanford University 1690
Development of finite-element methods for high-speed compressible flows governed by the fuller and Navier-Stokes equations
Period Obligations
05/01/83-04/30/90 FY89: \$101,778 TOTAL: \$559,619
Prin. Invest. NASA Tech. Officer CASE Category
Hughes, T. J. LARC/Olsen, G. C. 29-Math/Computer, NEC

NAG 2-248 Stanford University 1698
Design of testbed and emulation tools
Period Obligations
10/01/83-10/31/89 FY89: \$129,885 TOTAL: \$719,820
Prin. Invest. NASA Tech. Officer CASE Category
Lundstrom, S. F. ARC/Stevens Jr., K. G. 22-Computer Science
Flynn, M. J. ARC/Lim, R. S.
Tennal, K. B.

NAG 1-532 Stanford University 1691
Simulations of turbulent mixing and reacting flows and their application to turbulence modeling
Period Obligations
11/05/84-12/31/88 FY89: TOTAL: \$280,000
Prin. Invest. NASA Tech. Officer CASE Category
Ferziger, J. H. LARC/Drummond, J. P. 46-Mech Engr
Cantwell, B. J. LARC/Zang, T. A.

NAG 2-276 Stanford University 1699
High accuracy thermal conductivity measurements near the lambda transition of helium with very high temperature resolution
Period Obligations
11/01/83-08/31/88 FY89: TOTAL: \$120,533
Prin. Invest. NASA Tech. Officer CASE Category
Fairbanks, W. M. ARC/Kittel, P. 13-Physics
Lipa, J. A.

NAG 1-698 Stanford University 1692
Growth on new materials for solid state laser applications
Period Obligations
09/01/86-03/31/90 FY89: \$96,000 TOTAL: \$216,000
Prin. Invest. NASA Tech. Officer CASE Category
Feigelson, R. S. LARC/Barnes, N. P. 13-Physics
Route, R.

NAG 2-292 Stanford University 1700
Fiber optics implementation of EXPRESSNET
Period Obligations
01/01/84-12/31/87 FY89: TOTAL: \$150,192
Prin. Invest. NASA Tech. Officer CASE Category
Tobagi, F. A. ARC/Grant, T. L. 45-Elec Engr
ARC/Lum, H.

NAG 1-828 Stanford University 1693
Miniature solid state laser sources for inertial sensing
Period Obligations
11/02/87-11/01/88 FY89: TOTAL: \$29,960
Prin. Invest. NASA Tech. Officer CASE Category
Byer, R. L. LARC/Barnes, N. 13-Physics

NAG 2-472 Stanford University 1701
Experimental studies of H2/O2 reaction systems at thermal to hyperthermal energies
Period Obligations
09/01/87-08/31/89 FY89: \$50,000 TOTAL: \$80,000
Prin. Invest. NASA Tech. Officer CASE Category
Zare, R. N. ARC/Jaffe, R. L. 12-Chemistry

NAG 1-839 Stanford University 1694
Sunlight phase B study to design build and test a nonplanar ring oscillator
Period Obligations
12/16/87-02/28/90 FY89: \$125,000 TOTAL: \$235,000
Prin. Invest. NASA Tech. Officer CASE Category
Byer, R. L. LARC/Newcomb, A. L. 13-Physics
LARC/Nelms, R. R.

NAG 2-489 Stanford University 1702
Automated 3 D feature extraction from flow data
Period Obligations
10/01/87-09/30/89 FY89: \$155,989 TOTAL: \$337,857
Prin. Invest. NASA Tech. Officer CASE Category
Hesselink, L. ARC/Watson, V. R. 41-Aero Engr
Helman, J. ARC/Vaziri, A.
Wu, K.

**NASA'S UNIVERSITY PROGRAM
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NAG 2-520		Stanford University	1703
Plasma wave phenomena associated with the question of lightning on Venus			
<i>Period</i>	<i>Obligations</i>		
04/01/88-03/31/90	FY89: \$43,766	TOTAL: \$85,687	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Carpenter, D. L.	ARC/Lasher, L. E.	11-Astronomy	
	ARC/Fimmel, R. O.		
NAG 2-581		Stanford University	1704
Research on intelligent systems for science and engineering applications			
<i>Period</i>	<i>Obligations</i>		
03/01/89-12/31/89	FY89: \$588,000	TOTAL: \$588,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Feigenbaum, E. A.	ARC/Friedland, P. E.	22-Computer Science	
NAG 3-522		Stanford University	1705
Experimental study of the effects of very high turbulence on convective heat transfer			
<i>Period</i>	<i>Obligations</i>		
04/01/84-11/27/88	FY89:	TOTAL: \$407,708	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Moffat, R. J.	LERC/Gaugler, R. E.	46-Mech Engr	
Eaton, J. K.			
NAG 3-826		Stanford University	1706
Optimal trajectories for low thrust space missions			
<i>Period</i>	<i>Obligations</i>		
10/15/87-10/14/89	FY89: \$71,088	TOTAL: \$130,268	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Breakwell, J. V.	LERC/Mulac, M. W.	42-Astro Engr	
Golan, O. M.	LERC/Spurlock, O. F.		
NAG 3-908		Stanford University	1707
Optimal aerospace plane trajectories			
<i>Period</i>	<i>Obligations</i>		
06/01/88-01/05/90	FY89: \$29,517	TOTAL: \$101,616	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Breakwell, J. V.	LERC/Fishbach, L. H.	41-Aero Engr	
Golan, O. M.	LERC/Strack, W. C.		
NAG 3-914		Stanford University	1708
New visualization of multi-dimensional data			
<i>Period</i>	<i>Obligations</i>		
08/01/88-12/31/89	FY89:	TOTAL: \$45,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Chase, R. A.	LERC/Rabinowitz, M.	49-Engr, NEC	
Kim, S.			
Freedman, S.			
NAG 3-990		Stanford University	1709
Nonintrusive diagnostics for multiple point velocity measurements in supersonic inlets			
<i>Period</i>	<i>Obligations</i>		
01/23/89-10/31/89	FY89: \$100,000	TOTAL: \$100,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hanson, R. K.	LERC/Anderson, R. C.	46-Mech Engr	
	LERC/Lesco, D. J.		
NAG 3-1040		Stanford University	1710
An optical diagnostic facility for performance evaluation of low power arcjet thrusters			
<i>Period</i>	<i>Obligations</i>		
08/01/89-07/31/90	FY89: \$62,153	TOTAL: \$62,153	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Cappelli, M. A.	LERC/Carney, L. M.	46-Mech Engr	
Hanson, R. K.	LERC/Curran, F. M.		
NAG 5-476		Stanford University	1711
Investigations of controlled and naturally occurring wave-particle interaction			
<i>Period</i>	<i>Obligations</i>		
10/01/84-09/30/89	FY89: \$137,996	TOTAL: \$883,795	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Helliwell, R. A.	GSFC/Bullock, G. D.	19-Phys Sci, NEC	
	GSFC/Hoffman, R. A.		
NAG 5-622		Stanford University	1712
The development and test of multi-anode microchannel array detector systems II soft X-ray detectors			
<i>Period</i>	<i>Obligations</i>		
02/01/84-10/31/89	FY89:	TOTAL: \$302,343	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Timothy, J. G.	GSFC/Early, L. J.	13-Physics	
	GSFC/Pless, R. H.		
NAG 5-884		Stanford University	1713
A comparative study of Dynamics Explorer satellite ground whistler data			
<i>Period</i>	<i>Obligations</i>		
04/01/87-07/31/89	FY89:	TOTAL: \$69,135	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Carpenter, D. L.	GSFC/Bullock, G. D.	19-Phys Sci, NEC	
	GSFC/Hoffman, R. A.		
NAG 5-926		Stanford University	1714
Block rotations Fault domains and crustal deformation in the western United States			
<i>Period</i>	<i>Obligations</i>		
09/15/87-02/28/90	FY89: \$105,000	TOTAL: \$180,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Nur, A.	GSFC/Welker, J. E.	32-Geological Sci	
NAG 5-944		Stanford University	1715
Solar G mode oscillations comparison of SMM active cavity radiometer I radiance monitor and ground based observations			
<i>Period</i>	<i>Obligations</i>		
07/01/87-06/30/88	FY89:	TOTAL: \$17,137	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Schevyer, P. H.	GSFC/Bullock, G. D.	19-Phys Sci, NEC	
Walker, A. B.	GSFC/Gurman, J. B.		
NAG 5-1103		Stanford University	1716
Interactions in the magnetosphere between energetic particles and coherent very low frequency waves			
<i>Period</i>	<i>Obligations</i>		
10/15/88-10/14/89	FY89: \$116,000	TOTAL: \$116,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Helliwell, R. A.	GSFC/Wales, R. O.	39-Env Sci, NEC	
NAG 5-1155		Stanford University	1717
Geodesy coexperiment to the gravity probe B relatively gyroscope program			
<i>Period</i>	<i>Obligations</i>		
07/01/89-06/30/90	FY89: \$67,585	TOTAL: \$67,585	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Everitt, C. W.	GSFC/Welker, J. E.	32-Geological Sci	

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NAG 8-26 Stanford University 1718
Cryogenic equivalence principle experiment on shuttle
Period Obligations
08/01/84-01/02/90 FY89: \$250,000 TOTAL: \$1,019,999
Prin. Invest. NASA Tech. Officer CASE Category
Eeritt, C. W. MSFC/Decker, R. 13-Physics
Worden, P. W. MSFC/Strauss, E. N.

NAG 8-710 Stanford University 1719
Search for rapidly spinning neutron stars X ray timing and spectral observations of LMXRBS with ginga
Period Obligations
03/01/88-08/31/89 FY89: TOTAL: \$12,450
Prin. Invest. NASA Tech. Officer CASE Category
Michelson, P. F. MSFC/Havrisik, D. 13-Physics

NAG 8-715 Stanford University 1720
Combined buoyancy thermocapillary convection an experimental study
Period Obligations
04/01/88-09/30/89 FY89: TOTAL: \$35,000
Prin. Invest. NASA Tech. Officer CASE Category
Hornsy, G. M. MSFC/Witherow, W. J. 99-Multi-Discip

NAG 8-752 Stanford University 1721
Sensitivity of an imaging telescope grids for high energy gamma-ray astronomy
Period Obligations
10/01/88-12/29/89 FY89: \$26,809 TOTAL: \$26,809
Prin. Invest. NASA Tech. Officer CASE Category
Yearian, M. R. MSFC/Nein, M. 11-Astronomy
Hughes, E. B.

NAG 8-774 Stanford University 1722
Protein crystal growth in low gravity
Period Obligations
04/27/89-04/26/90 FY89: \$145,000 TOTAL: \$145,000
Prin. Invest. NASA Tech. Officer CASE Category
Feigelson, R. S. MSFC/Pusey, M. 19-Phys Sci, NEC

NAG 8-778 Stanford University 1723
VLF VL remote sensing of ionospheric effects of gamma ray bursts and lightning induced electron precipitation
Period Obligations
06/01/89-05/31/90 FY89: \$49,946 TOTAL: \$49,946
Prin. Invest. NASA Tech. Officer CASE Category
Inan, U. S. MSFC/Fishman, G. J. 11-Astronomy
MSFC/Parnell, T. A.

NAG 8-784 Stanford University 1724
A de 1 whistler study of thermal plasma structure and dynamics in the disk bulge of the magnetosphere
Period Obligations
08/01/89-07/31/92 FY89: \$39,999 TOTAL: \$39,999
Prin. Invest. NASA Tech. Officer CASE Category
Carpenter, D. L. MSFC/Giles, B. L. 19-Phys Sci, NEC
MSFC/Fields, S. A.

NAG 9-262 Stanford University 1725
Very large scale integration spine manipulator
Period Obligations
11/01/87-05/01/89 FY89: TOTAL: \$77,563
Prin. Invest. NASA Tech. Officer CASE Category
Leifer, L. J. JSC/Stokes, L. 46-Mech Engr
Maynard, R.

NAG 9-344 Stanford University 1726
The processes of production dispersal and fall of distal impact ejecta on the early Archean Earth
Period Obligations
04/01/89-04/01/90 FY89: \$28,000 TOTAL: \$28,000
Prin. Invest. NASA Tech. Officer CASE Category
Lowe, D. R. JSC/Browne, I. D. 32-Geological Sci

NAGW 235 Stanford University 1727
Study of the dynamics of atmosphere-ionosphere-magnetosphere interactions
Period Obligations
08/15/81-08/31/89 FY89: TOTAL: \$3,455,845
Prin. Invest. NASA Tech. Officer CASE Category
Banks, P. M. HQ-EE/Mellott, M. M. 42-Astro Engr
HQ-EE/Parks, G. K.

NAGW 278 Stanford University 1728
Theoretical studies of the solar wind flow around the Earth and other planets
Period Obligations
03/01/82-12/31/89 FY89: TOTAL: \$420,500
Prin. Invest. NASA Tech. Officer CASE Category
Spreiter, J. R. HQ-ES/Mellott, M. M. 13-Physics
HQ-EE/Eastman, T. E.

NAGW 299 Stanford University 1729
Theoretical studies of cosmological tests from space observations
Period Obligations
03/01/82-03/31/90 FY89: \$29,347 TOTAL: \$156,353
Prin. Invest. NASA Tech. Officer CASE Category
Wagoner, R. V. HQ-EZ/Clayton, G. C. 11-Astronomy
HQ-EZ/Bogges, N. W.

NAGW 419 Stanford University 1730
Formation of the Stanford center for aeronautics and space information sciences
Period Obligations
01/12/83-11/30/89 FY89: \$1,016,000 TOTAL: \$6,013,000
Prin. Invest. NASA Tech. Officer CASE Category
Banks, P. M. HQ-RC/Smith, P. H. 22-Computer Science
Wiskerchen, M. J. HQ-RC/Holcomb, L. B.

NAGW 540 Stanford University 1731
Evaluation of a deformable diffraction grating for a stigmatic EUV spectroheliometer
Period Obligations
02/15/84-11/30/89 FY89: \$78,990 TOTAL: \$410,618
Prin. Invest. NASA Tech. Officer CASE Category
Timothy, J. G. HQ-ES/Bohlin, J. D. 13-Physics
HQ-ES/Kane, S.

NAGW 628 Stanford University 1732
Interpretation of SAR images of sea ice
Period Obligations
03/01/84-11/30/89 FY89: \$94,604 TOTAL: \$513,057
Prin. Invest. NASA Tech. Officer CASE Category
Vesecky, J. HQ-EE/Thomas, R. H. 33-Oceanography
Bracewell, R. HQ-EE/Wilson, W. S.

NAGW 965 Stanford University 1733
Graduate hypersonic training and research
Period Obligations
08/01/86-07/31/90 FY89: \$200,000 TOTAL: \$898,000
Prin. Invest. NASA Tech. Officer CASE Category
Chapman, D. R. HQ-RF/Wander, S. M. 13-Physics
Baganoff, D. HQ-RF/Graves, R. A.

**NASA'S UNIVERSITY PROGRAM
CALIFORNIA (Continued)**

NAGW 1068 **Stanford University** **1734**
Trace gas fluxes from amalongan forests influence of soil fertility and disturbance
Period *Obligations*
03/15/87-03/14/90 FY89: TOTAL: \$114,916
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Vitousek, P. HQ-EB/Averner, M. M. 51-Biological Sci

NAGW 1140 **Stanford University** **1735**
Development and test of a pulse counting imaging detector system
Period *Obligations*
08/01/87-10/31/89 FY89: TOTAL: \$119,966
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Timothy, J. G. HQ-EL/Mahaffy, P. 32-Geological Sci
HQ-EL/Quaide, W. L.

NAGW 1180 **Stanford University** **1736**
The small scale structure and dynamics of Uranus atmosphere
Period *Obligations*
09/15/87-09/30/90 FY89: \$45,000 TOTAL: \$190,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Eshelman, V. R. HQ-EL/Quaide, W. L. 11-Astronomy
HQ-EL/Brinton, H. C.

NAGW 1210 **Stanford University** **1737**
Analysis and interpretation of Voyager radio occultation observations of Uranus rings
Period *Obligations*
10/01/87-09/30/89 FY89: \$179,029 TOTAL: \$363,732
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Tyler, G. L. HQ-EL/Quaide, W. L. 11-Astronomy
HQ-EL/Boyce, J. M.

NAGW 1252 **Stanford University** **1738**
Evaluation of the pidas field spectrometer
Period *Obligations*
12/01/87-11/30/88 FY89: TOTAL: \$15,307
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lyon, R. J. HQ-EE/Wickland, D. E. 39-Env Sci, NEC
HQ-EE/Ruzek, M. J.

NAGW 1566 **Stanford University** **1739**
Dynamic processes related to active experiments in space plasmas
Period *Obligations*
10/01/88-09/30/89 FY89: \$239,000 TOTAL: \$239,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Banks, P. M. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Perry, T. W.

NAGW 1582 **Stanford University** **1740**
Precipitation of radiation belt particles by ducted and nonducted whistler waves
Period *Obligations*
02/01/89-01/31/90 FY89: \$60,000 TOTAL: \$60,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Inan, U. S. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Perry, T. W.

NAGW 1634 **Stanford University** **1741**
Computer assisted analysis of auroral images obtained from high altitude polar satellites
Period *Obligations*
02/01/89-01/31/90 FY89: \$60,000 TOTAL: \$60,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Vescky, J. F. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Perry, T. W.

NAGW 1680 **Stanford University** **1742**
Mechanisms of generation evolution and propagation of VLF waves in the topside ionosphere and magnetosphere
Period *Obligations*
03/01/89-02/28/90 FY89: \$100,000 TOTAL: \$100,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Helliwell, R. A. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Perry, T. W.

NAGW 1749 **Stanford University** **1743**
X ray optics for high resolution heliospectroscopy
Period *Obligations*
03/01/89-02/28/90 FY89: \$60,000 TOTAL: \$60,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Walker, A. B. HQ-ES/Bohlin, J. D. 13-Physics
HQ-ES/Kane, S.

NAGW 1755 **Stanford University** **1744**
Microwave transmission properties of the liquid relevant to Titan
Period *Obligations*
04/01/89-12/31/89 FY89: \$54,716 TOTAL: \$54,716
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Eshleman, V. R. HQ-EL/Underwood, J. R. 32-Geological Sci

NAGW 1790 **Stanford University** **1745**
Magnetohydrodynamic studies of solar wind flow around the Earth and other planets
Period *Obligations*
08/01/89-07/31/90 FY89: \$28,000 TOTAL: \$28,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Spreiter, J. R. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Perry, T. W.

NAS 1-18778 **Stanford University** **1746**
Damage tolerance of thermoplastic composites
Period *Obligations*
12/16/88-03/15/90 FY89: \$116,602 TOTAL: \$116,602
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Springer, G. S. LARC/Poe, C. 13-Physics
LARC/Harris, C. E.

NAS 5-27557 **Stanford University** **1747**
Implementation phase for the energetic gamma experiment telescope (EGRET)
Period *Obligations*
03/07/83-02/18/90 FY89: \$995,792 TOTAL: \$11,614,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hofstadter, R. GSFC/Hartman, R. C. 11-Astronomy
Hughes, E. B. GSFC/Campbell, C. E.

NAS 5-29389 **Stanford University** **1748**
Development of the MAMA detectors for the HST imaging spectrograph
Period *Obligations*
12/15/86-10/31/89 FY89: \$898,974 TOTAL: \$2,049,353
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Timothy, J. G. GSFC/Vitagliano, D. 41-Aero Engr

NAS 5-30347 **Stanford University** **1749**
Technology and requirements for low cost small attached tethered systems for the international space station
Period *Obligations*
08/30/88-11/30/88 FY89: TOTAL: \$23,764
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Banks, P. GSFC/Hibbard, W. 31-Atmos Sci
Williamson, R.

NASA'S UNIVERSITY PROGRAM CALIFORNIA (Continued)

NCA 2-243 Nonequilibrium rarefied flow <i>Period</i> 07/01/87-06/30/89 <i>Prin. Invest.</i> MacCormack, R. W. Chapman, D. R.	Stanford University FY89: NASA Tech. Officer ARC/Deiwert, G. S.	1766 <i>Obligations</i> TOTAL: \$44,887 CASE Category 41-Aero Engr	NCA 2-285 Simulation of turbulent reacting flows <i>Period</i> 01/01/88-12/31/89 <i>Prin. Invest.</i> Ferziger, J. H.	Stanford University FY89: \$49,140 NASA Tech. Officer ARC/Kim, J.	1774 <i>Obligations</i> TOTAL: \$75,805 CASE Category 46-Mech Engr
NCA 2-258 Theoretical ecology a relationship with NASA's research in life sciences <i>Period</i> 10/01/87-09/30/89 <i>Prin. Invest.</i> Roughgarden, J.	Stanford University FY89: \$40,000 NASA Tech. Officer ARC/MacElroy, R. D.	1767 <i>Obligations</i> TOTAL: \$80,000 CASE Category 51-Biological Sci	NCA 2-286 Two dimensional magnetized solar wind model <i>Period</i> 02/01/88-12/31/89 <i>Prin. Invest.</i> Owen Storey, L. R.	Stanford University FY89: \$3,224 NASA Tech. Officer ARC/Barnes, A.	1775 <i>Obligations</i> TOTAL: \$53,224 CASE Category 11-Astronomy
NCA 2-259 Numerical techniques for solving the Navier-Stokes equations with a two equation turbulence model in three dimensions <i>Period</i> 10/01/87-09/30/89 <i>Prin. Invest.</i> MacCormack, R. W.	Stanford University FY89: \$31,875 NASA Tech. Officer ARC/Viegas, J. R.	1768 <i>Obligations</i> TOTAL: \$61,927 CASE Category 41-Aero Engr	NCA 2-287 Unsteady flow measurements on delta wing models forced to high angles of attack <i>Period</i> 01/01/88-03/31/89 <i>Prin. Invest.</i> Ashley, H.	Stanford University FY89: NASA Tech. Officer ARC/Margason, R. J. ARC/Naumowicz, T.	1776 <i>Obligations</i> TOTAL: \$25,000 CASE Category 41-Aero Engr
NCA 2-263 Large impacts during Earth's accretion <i>Period</i> 09/16/87-09/30/89 <i>Prin. Invest.</i> Sleep, N.	Stanford University FY89: \$9,496 NASA Tech. Officer ARC/Pollack, J. B. ARC/Pollack, J. B.	1769 <i>Obligations</i> TOTAL: \$59,487 CASE Category 11-Astronomy	NCA 2-302 Preliminary design of a satellite kinetic tether experiment <i>Period</i> 04/01/88-06/30/89 <i>Prin. Invest.</i> Barkan, P. Newman, E. Fuchs, H.	Stanford University FY89: NASA Tech. Officer ARC/Lemke, L. G.	1777 <i>Obligations</i> TOTAL: \$15,806 CASE Category 46-Mech Engr
NCA 2-265 A new laser Doppler velocimeter approach for near wall and three dimensional turbulence measurements <i>Period</i> 11/01/87-10/31/89 <i>Prin. Invest.</i> Eaton, J. K.	Stanford University FY89: \$35,000 NASA Tech. Officer ARC/Johnson, D. A.	1770 <i>Obligations</i> TOTAL: \$70,296 CASE Category 46-Mech Engr	NCA 2-308 Preliminary design of a low cost instrument deployment mechanism <i>Period</i> 04/01/88-09/30/88 <i>Prin. Invest.</i> Barkan, P. Newman, E. Reeves, E.	Stanford University FY89: NASA Tech. Officer ARC/Black, D. C. ARC/Lemke, L. G.	1778 <i>Obligations</i> TOTAL: \$15,559 CASE Category 46-Mech Engr
NCA 2-269 Investigation and evaluation for private sector utilization and operation of RRS capabilities <i>Period</i> 10/15/87-04/30/88 <i>Prin. Invest.</i> Germane, G.	Stanford University FY89: NASA Tech. Officer ARC/Givens, J. J.	1771 <i>Obligations</i> TOTAL: \$39,740 CASE Category 99-Multi-Discip	NCA 2-311 Repair of damaged composites <i>Period</i> 06/01/88-05/31/90 <i>Prin. Invest.</i> Springer, G. S.	Stanford University FY89: NASA Tech. Officer ARC/Nelson, H. G.	1779 <i>Obligations</i> TOTAL: \$20,000 CASE Category 41-Aero Engr
NCA 2-271 Application of the joined wing concept to transport aircraft design and evaluation <i>Period</i> 10/15/87-06/01/89 <i>Prin. Invest.</i> Kroo, I.	Stanford University FY89: NASA Tech. Officer ARC/Smith, S. C.	1772 <i>Obligations</i> TOTAL: \$33,990 CASE Category 41-Aero Engr	NCA 2-313 Development of a particle simulation method for rarefied hypersonic flows <i>Period</i> 04/01/88-03/31/90 <i>Prin. Invest.</i> Baganoff, D.	Stanford University FY89: \$39,941 NASA Tech. Officer ARC/Deiwert, G. S. ARC/Feiereisen, W. J.	1780 <i>Obligations</i> TOTAL: \$79,928 CASE Category 41-Aero Engr
NCA 2-283 Studies of Saturn's ring system <i>Period</i> 01/01/88-12/31/89 <i>Prin. Invest.</i> Tyler, G. L.	Stanford University FY89: \$40,000 NASA Tech. Officer ARC/Cuzzi, J. N.	1773 <i>Obligations</i> TOTAL: \$80,000 CASE Category 11-Astronomy	NCA 2-331 Wavefront control for a large segmented mirror telescope <i>Period</i> 06/01/88-03/31/89 <i>Prin. Invest.</i> Goodman, J. W.	Stanford University FY89: NASA Tech. Officer ARC/Ochoa, E.	1781 <i>Obligations</i> TOTAL: \$19,960 CASE Category 45-Elec Engr

**NASA'S UNIVERSITY PROGRAM
CALIFORNIA (Continued)**

NCA 2-332 Stanford University 1782
The paleoecology of early Archean terrestrial organisms and its relevance to the evolution of life on Mars
Period Obligations
07/01/88-06/30/90 FY89: \$22,100 TOTAL: \$44,100
Prin. Invest. NASA Tech. Officer CASE Category
Lowe, D. R. ARC/Marais, D. D. 32-Geological Sci

NCA 2-333 Stanford University 1783
Technology and requirements for low cost reusable reentry satellite system development and operations planning
Period Obligations
06/13/88-10/01/89 FY89: TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
Banks, P. P. ARC/Lee, G. S. 49-Engr, NEC

NCA 2-338 Stanford University 1784
Advanced architecture for knowledge based systems
Period Obligations
07/01/88-06/30/90 FY89: TOTAL: \$39,943
Prin. Invest. NASA Tech. Officer CASE Category
Flynn, M. J. ARC/Lum, H. 29-Math/Computer, NEC

NCA 2-339 Stanford University 1785
Experimental blade compressible vortex interaction diagnostics and code verification analysis
Period Obligations
07/01/88-06/30/90 FY89: \$24,900 TOTAL: \$48,805
Prin. Invest. NASA Tech. Officer CASE Category
Bershadar, D. ARC/Yu, Y. H. 41-Aero Engr
ARC/Tung, C.

NCA 2-343 Stanford University 1786
Aerodynamics of the oblique flying wing concept
Period Obligations
06/21/88-03/31/89 FY89: TOTAL: \$20,000
Prin. Invest. NASA Tech. Officer CASE Category
Kroo, I. ARC/Mehta, U. 41-Aero Engr

NCA 2-344 Stanford University 1787
Hydrological modeling of tropical wetland dynamics
Period Obligations
08/15/88-08/14/90 FY89: TOTAL: \$30,000
Prin. Invest. NASA Tech. Officer CASE Category
Remson, I. ARC/Sebesta, P. D. 39-Env Sci, NEC
Gorelick, S.

NCA 2-360 Stanford University 1788
The oxidation of carbon monoxide by oxygen atoms on surfaces of materials used in space vehicles
Period Obligations
10/01/88-09/30/89 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
Boudart, M. ARC/Altman, R. L. 43-Chem Engr

NCA 2-361 Stanford University 1789
Numerical study on the stability of an isolated inviscid compressible vortex
Period Obligations
10/01/88-09/30/89 FY89: \$27,425 TOTAL: \$27,425
Prin. Invest. NASA Tech. Officer CASE Category
Spreiter, J. R. ARC/Pulliam, T. H. 41-Aero Engr

NCA 2-363 Stanford University 1790
Graphic analysis of numerical flow data sets
Period Obligations
10/01/88-09/30/90 FY89: \$30,774 TOTAL: \$30,774
Prin. Invest. NASA Tech. Officer CASE Category
Hesselink, L. ARC/Schiff, L. B. 41-Aero Engr

NCA 2-378 Stanford University 1791
Computation of hypersonic dusty flow about a vehicle entering the Martian atmosphere
Period Obligations
01/01/89-12/31/90 FY89: \$33,000 TOTAL: \$33,000
Prin. Invest. NASA Tech. Officer CASE Category
Chang, I. D. ARC/Tauber, M. E. 41-Aero Engr

NCA 2-389 Stanford University 1792
Neural networks for nonlinear control
Period Obligations
04/01/89-03/31/91 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
Widrow, B. ARC/Ochoa, E. 45-Elec Engr

NCA 2-393 Stanford University 1793
An advanced infrared space telescope
Period Obligations
02/01/89-09/01/89 FY89: \$33,390 TOTAL: \$33,390
Prin. Invest. NASA Tech. Officer CASE Category
Lusignan, B. ARC/Brooks, W. F. 11-Astronomy

NCA 2-396 Stanford University 1794
An analytical study of downslope winds associated with localized topography on Mars
Period Obligations
04/01/89-03/31/90 FY89: \$21,400 TOTAL: \$21,400
Prin. Invest. NASA Tech. Officer CASE Category
Tyler, G. L. ARC/Young, R. E. 11-Astronomy

NCA 2-420 Stanford University 1795
Remote sensing of mosquito habitats in Chiapas Mexico joint research interchange
Period Obligations
06/12/89-01/11/90 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
Banks, P. ARC/Sebesta, P. D. 45-Elec Engr
Vesecky, J. F.

NCA 2-425 Stanford University 1796
Experimental investigation of the effects of free electrons on physico chemical phenomena in highly energized shock heated gases
Period Obligations
07/01/89-06/30/91 FY89: \$16,000 TOTAL: \$16,000
Prin. Invest. NASA Tech. Officer CASE Category
Bershadar, D. ARC/Sharma, S. P. 41-Aero Engr
ARC/Deiwert, G. S.

NCA 2-431 Stanford University 1797
Time dependent simulation of the flow around the prosthetic heart valves
Period Obligations
07/01/89-06/30/91 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
Chang, I. D. ARC/Kwak, D. 41-Aero Engr

NASA'S UNIVERSITY PROGRAM CALIFORNIA (Continued)

NCA 2-434	Stanford University		1798
	Helicopter blade vortex formation		
	<i>Period</i>	<i>Obligations</i>	
	07/01/89-06/30/91	FY89: \$22,000	TOTAL: \$22,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Bradshaw, P.	ARC/Ziliac, G.	46-Mech Engr
		ARC/Carr, L.	
NCA 2-437	Stanford University		1799
	Inclusion of burnett terms in 2-D shock wave calculations		
	<i>Period</i>	<i>Obligations</i>	
	07/01/89-06/30/90	FY89: \$12,588	TOTAL: \$12,588
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	MacCormack, R. W.	ARC/Deiwert, G. S.	41-Aero Engr
	Chapman, D. R.		
NCA 2-440	Stanford University		1800
	Software systems for composite adaptive grid methods for fluid dynamics		
	<i>Period</i>	<i>Obligations</i>	
	07/15/89-07/14/91	FY89: \$38,182	TOTAL: \$38,182
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Oliger, J.	ARC/Kwak, D.	22-Computer Science
NCA 2-447	Stanford University		1801
	Environmental and operational considerations in the design of an oblique flying wing supersonic transport joint research interchange		
	<i>Period</i>	<i>Obligations</i>	
	07/15/89-07/14/91	FY89: \$35,000	TOTAL: \$35,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Kroo, I.	ARC/Lomax, H.	41-Aero Engr
NCC 2-55	Stanford University		1802
	The research and training activities for the Joint Institute for Aeronautics and Acoustics		
	<i>Period</i>	<i>Obligations</i>	
	12/01/79-09/30/89	FY89: \$753,478	TOTAL: \$3,001,588
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Roberts, L.	ARC/Edenborough, H. K.	41-Aero Engr
		ARC/Murphy, J. D.	
NCC 2-106	Stanford University		1803
	Studies of flight director systems for powered lift aircraft		
	<i>Period</i>	<i>Obligations</i>	
	11/01/80-09/30/89	FY89:	TOTAL: \$957,504
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Bryson, A. E., Jr.	ARC/Hilbert, K. B.	41-Aero Engr
	Hindson, W. S.	ARC/Chen, R. T.	
NCC 2-295	Stanford University		1804
	Design development of an EVA prehensor		
	<i>Period</i>	<i>Obligations</i>	
	01/01/84-04/30/88	FY89:	TOTAL: \$546,992
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Leifer, L.	ARC/Vykukal, H. C.	49-Engr, NEC
	Leblanc, M.		
NCC 2-304	Stanford University		1805
	Environmental effects on composite materials		
	<i>Period</i>	<i>Obligations</i>	
	08/01/84-02/28/89	FY89:	TOTAL: \$140,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Springer, G. S.	ARC/Nelson, H. G.	47-Materials Engr
NCC 2-307	Stanford University		1806
	To initiate a NASA/university collaborative center of excellence in model-based human performance		
	<i>Period</i>	<i>Obligations</i>	
	07/01/84-11/14/89	FY89: \$214,552	TOTAL: \$991,933
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Wandell, B. A.	ARC/Ahumada, A. J.	69-Psych, NEC
		ARC/Watson, A. B.	
NCC 2-322	Stanford University		1807
	Stanford/Ames Institute for Space Research		
	<i>Period</i>	<i>Obligations</i>	
	09/01/84-10/31/89	FY89: \$45,590	TOTAL: \$336,683
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Petrosian, V.	ARC/Dyal, P.	99-Multi-Discip
		ARC/Brockner, D.	
NCC 2-326	Stanford University		1808
	Studies of influence of blowing on vortical lift		
	<i>Period</i>	<i>Obligations</i>	
	10/01/84-10/31/88	FY89:	TOTAL: \$320,981
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Roberts, L.	ARC/Murphy, J.	41-Aero Engr
	Wood, N.	ARC/Erickson, G. E.	
NCC 2-333	Stanford University		1809
	Control of spacecraft manipulator systems		
	<i>Period</i>	<i>Obligations</i>	
	11/01/84-10/31/89	FY89: \$599,800	TOTAL: \$2,089,800
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Cannon, R. H.	ARC/Lum, H.	42-Astro Engr
		ARC/McKellar, D.	
NCC 2-384	Stanford University		1810
	Aerodynamics of oblique wings		
	<i>Period</i>	<i>Obligations</i>	
	10/01/85-08/31/88	FY89:	TOTAL: \$149,751
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Kroo, I. B.	ARC/Smith, S. C.	41-Aero Engr
		ARC/Carmichael, R. L.	
NCC 2-389	Stanford University		1811
	Develop the kinetic isolation tether experiment		
	<i>Period</i>	<i>Obligations</i>	
	01/01/86-12/31/89	FY89: \$28,832	TOTAL: \$382,501
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Powell, J. D.	ARC/Lemke, L. G.	42-Astro Engr
		ARC/Smith, M. A.	
NCC 2-390	Stanford University		1812
	Study of augmentor delta wing aerodynamics		
	<i>Period</i>	<i>Obligations</i>	
	10/01/85-10/31/88	FY89:	TOTAL: \$85,365
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Roberts, L.	ARC/Erickson, L. E.	41-Aero Engr
	Lund, T.	ARC/Corsiglia, V. R.	
NCC 2-394	Stanford University		1813
	The physical and chemical properties of small metal particles/clusters, part I		
	<i>Period</i>	<i>Obligations</i>	
	11/01/85-10/31/89	FY89:	TOTAL: \$300,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Madix, R. J.	ARC/Cooper, D. M.	12-Chemistry
	Boudart, M.		
	Lindau, I.		

**NASA'S UNIVERSITY PROGRAM
CALIFORNIA (Continued)**

NCC 2-445 Stanford University 1814
SETI instrumentation systems research
Period *Obligations*
10/01/86-10/31/89 FY89: \$84,406 TOTAL: \$774,451
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Peterson, A. M. ARC/Jones, H. W. 45-Elec Engr
Linscott, I. R. ARC/Oliver, B. M.

NCC 2-543 Stanford University 1822
Aerodynamic and thermal control of hypersonic vehicles through leading edge blowing
Period *Obligations*
10/01/87-03/31/89 FY89: TOTAL: \$116,514
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Roberts, L. ARC/Holst, T. L. 41-Aero Engr
ARC/Chaussee, D. S.

NCC 2-460 Stanford University 1815
Center for turbulence research
Period *Obligations*
12/01/86-10/31/89 FY89: \$1,350,344 TOTAL: \$2,633,291
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Moin, P. ARC/Rogallo, R. F. 46-Mech Engr
Reynolds, W. C. ARC/Lomax, H.

NCC 2-547 Stanford University 1823
Laser based measurements of OH in a shock tunnel
Period *Obligations*
07/01/88-12/31/89 FY89: \$100,000 TOTAL: \$210,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hanson, R. K. ARC/Chapman, G. T. 41-Aero Engr
ARC/Strawa, A.

NCC 2-494 Stanford University 1816
Intelligent communicating agents
Period *Obligations*
08/01/87-10/31/89 FY89: \$517,814 TOTAL: \$1,745,809
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Nilsson, N. J. ARC/Friedland, P. E. 22-Computer Science
ARC/Zweben, M.

NCC 2-549 Stanford University 1824
Shock tube investigation of dynamic response of pressure transducers for validation of rotor performance measurements
Period *Obligations*
07/01/88-12/31/88 FY89: TOTAL: \$12,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bershadar, D. ARC/Baker, F. A. 41-Aero Engr
ARC/Cross, J.

NCC 2-510 Stanford University 1817
Effects of residual stress on cracks at weldments
Period *Obligations*
10/15/87-10/14/90 FY89: \$21,835 TOTAL: \$51,835
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Nelson, D. V. ARC/Nelson, H. G. 47-Materials Engr

NCC 2-574 Stanford University 1825
Visual navigation for nap of the Earth flight
Period *Obligations*
10/01/88-12/31/89 FY89: \$60,000 TOTAL: \$60,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Binford, T. O. ARC/Sridhar, B. 22-Computer Science

NCC 2-514 Stanford University 1818
Conservation of design knowledge
Period *Obligations*
12/01/87-05/31/90 FY89: \$443,420 TOTAL: \$643,132
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Leifer, L. ARC/Friedland, P. E. 22-Computer Science
ARC/Brooks, W.

NCC 2-610 Stanford University 1826
Turbulence modelling for compressible flow
Period *Obligations*
06/01/89-08/31/90 FY89: \$125,000 TOTAL: \$125,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bradshaw, P. ARC/Coakley, T. J. 41-Aero Engr
ARC/Marvin, J. G.

NCC 2-528 Stanford University 1819
The variable gravity facility
Period *Obligations*
02/01/88-01/31/90 FY89: \$113,886 TOTAL: \$166,286
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Powell, J. D. ARC/Lemke, L. G. 42-Astro Engr

NCC 2-622 Stanford University 1827
Communication and air safety: Analysis of routine communication in the air traffic control system
Period *Obligations*
09/01/89-08/31/90 FY89: \$95,214 TOTAL: \$95,214
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Clark, H. H. ARC/Lee, A. T. 69-Psych, NEC
ARC/Graeber, R. C.

NCC 2-532 Stanford University 1820
Circulation control aerodynamics
Period *Obligations*
10/01/87-10/31/88 FY89: TOTAL: \$15,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Roberts, L. ARC/Viegas, J. R. 41-Aero Engr
ARC/Marvin, J. G.

NCC 2-633 Stanford University 1828
Arpanet-Barnet development and transition project
Period *Obligations*
03/01/89-12/31/89 FY89: \$355,905 TOTAL: \$355,905
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Street, R. L. ARC/Lum, H. 22-Computer Science
ARC/McKellar, D.

NCC 2-537 Stanford University 1821
Development of a reusable knowledge base for space applications
Period *Obligations*
11/01/87-10/31/89 FY89: \$620,171 TOTAL: \$856,719
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Buchanan, B. G. ARC/Friedland, P. E. 22-Computer Science
Feigenbaum, E. A. MSFC/Freeman, M.

NCC 2-641 Stanford University 1829
Crew alertness management on the flight deck: Physiological measures of sleepiness/alertness
Period *Obligations*
09/01/89-08/31/90 FY89: \$63,235 TOTAL: \$63,235
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Dement, W. C. ARC/Graeber, R. C. 61-Biol Aspects
Rosekind, M. R. ARC/Dammann, K.

NASA'S UNIVERSITY PROGRAM CALIFORNIA (Continued)

NCC 5-30	Stanford University	1830	Space science mission operations support
<i>Period</i>	<i>Obligations</i>		
03/01/84-06/30/89	FY89: \$67,224	TOTAL: \$1,959,626	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Banks, P. M.	GSFC/Kelth, B. H.	49-Engr, NEC	
Bush, R. I.			
NCC 9-15	Stanford University	1831	Remote science operation center research
<i>Period</i>	<i>Obligations</i>		
02/01/86-02/01/90	FY89: \$199,619	TOTAL: \$781,964	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Banks, P. M.	JSC/Leblanc, G. R.	49-Engr, NEC	
NCC10-1	Stanford University	1832	Space systems integration and operations research applications
<i>Period</i>	<i>Obligations</i>		
11/14/86-12/17/89	FY89: \$780,823	TOTAL: \$2,681,412	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Banks, P. M.	KSC/Spears, J. M.	22-Computer Science	
Leifer, L.	KSC/Moja, D. A.		
NGL 05-020-014	Stanford University	1833	Theoretical and experimental radio and radar studies of lunar, planetary ionospheres, atmospheres, and surfaces of Sun and interplanetary medium
<i>Period</i>	<i>Obligations</i>		
04/30/63-09/30/89	FY89: \$85,000	TOTAL: \$4,916,349	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Eshleman, V. R.	HQ-EL/Bergstralh, J.	31-Atmos Sci	
	HQ-EL/Quade, W. L.		
NGL 05-020-243	Stanford University	1834	Refined methods of aeroelastic analysis and optimization
<i>Period</i>	<i>Obligations</i>		
08/14/67-08/31/91	FY89: \$22,000	TOTAL: \$403,764	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Ashley, H.	LARC/Doggett, R. V., Jr.	41-Aero Engr	
NGL 05-020-272	Stanford University	1835	Theoretical study of the solar atmosphere and the structure of active regions
<i>Period</i>	<i>Obligations</i>		
06/07/68-09/30/89	FY89: \$164,000	TOTAL: \$2,218,013	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Sturrock, P. A.	HQ-ES/Bohlin, J. D.	13-Physics	
	HQ-ES/Kane, S.		
NGR 05-020-559	Stanford University	1836	Structure of solar magnetic and velocity fields
<i>Period</i>	<i>Obligations</i>		
03/22/72-11/30/89	FY89: \$146,338	TOTAL: \$1,909,164	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Scherrer, P. H.	HQ-ES/Bohlin, J. D.	11-Astronomy	
	HQ-ES/Kane, S.		
NGR 05-020-649	Stanford University	1837	Study of lunar and planetary surfaces
<i>Period</i>	<i>Obligations</i>		
03/06/73-10/31/89	FY89: \$45,800	TOTAL: \$433,857	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Tyler, G. L.	HQ-EL/Underwood, J. R.	32-Geological Sci	
	HQ-EL/Boyce, J. M.		
NGR 05-020-668	Stanford University	1838	Magnetosphere structure and radiation mechanisms on pulsars
<i>Period</i>	<i>Obligations</i>		
11/01/73-10/31/89	FY89: \$90,000	TOTAL: \$655,892	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Sturrock, P. A.	HQ-EZ/Kaluzienski, L. J.	11-Astronomy	
	HQ-EZ/Bunner, A. N.		
NGT 00-050-016	Stanford University	1839	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
06/15/86-06/14/89	FY89:	TOTAL: \$54,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Banks, P. M.	HQ-LE/Owens, F. C.	45-Elec Engr	
NGT 00-050-035	Stanford University	1840	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
07/01/86-06/30/89	FY89:	TOTAL: \$54,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Timothy, J. G.	HQ-LE/Owens, F. C.	13-Physics	
NGT 00-050-151	Stanford University	1841	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
06/15/87-06/14/90	FY89: \$18,000	TOTAL: \$54,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Banks, P. M.	HQ-XE/Owens, F. C.	45-Elec Engr	
NGT 00-050-168	Stanford University	1842	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
06/22/87-08/31/89	FY89: \$7,129	TOTAL: \$43,129	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Shortliffe, E.	HQ-XE/Owens, F. C.	22-Computer Science	
NGT 00-050-171	Stanford University	1843	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
10/01/87-09/30/90	FY89: \$18,000	TOTAL: \$36,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Vitousek, P.	HQ-XE/Owens, F. C.	99-Multi-Discip	
NGT 00-050-347	Stanford University	1844	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
08/01/88-07/31/90	FY89: \$18,000	TOTAL: \$36,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Petrocian, V.	HQ-XE/Owens, F. C.	13-Physics	
NGT 00-050-350	Stanford University	1845	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
08/01/88-07/31/89	FY89:	TOTAL: \$16,500	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hargens, A.	HQ-XE/Owens, F. C.	56-Medical Sciences	
NGT 00-050-359	Stanford University	1846	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
09/16/88-09/15/90	FY89:	TOTAL: \$18,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Bryson, A. E.	HQ-XE/Owens, F. C.	41-Aero Engr	

**NASA'S UNIVERSITY PROGRAM
CALIFORNIA (Continued)**

NGT 00-050-383 **Stanford University** **1847**
NASA graduate student researchers program
Period *Obligations*
09/01/88-12/31/90 FY89: TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Banks, P. HQ-XE/Owens, F. C. 13-Physics
Wiskerchen, M.
Cutkosky, M.

NGT 00-070-078 **Stanford University** **1856**
NASA graduate student researchers underrepresented minority focus program
Period *Obligations*
04/01/88-03/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
MacCormack, R. W. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 00-050-386 **Stanford University** **1848**
NASA graduate student researchers program
Period *Obligations*
09/25/88-09/24/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Flynn, M. J. HQ-XE/Owens, F. C. 45-Elec Engr

NGT 00-070-116 **Stanford University** **1857**
Minority graduate program
Period *Obligations*
10/01/89-03/31/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Banks, P. M. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 00-050-389 **Stanford University** **1849**
NASA graduate student researchers program
Period *Obligations*
08/01/88-07/31/89 FY89: TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bershader, D. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 05-020-412 **Stanford University** **1858**
A summer program of NASA summer faculty fellowships
Period *Obligations*
12/16/69-03/31/90 FY89: \$359,341 TOTAL: \$4,701,698
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bershader, D. HQ-XE/McGee, A. S. 49-Engr, NEC
Mayers, J. HQ-XE/Schwartz, E. T.

NGT 00-050-431 **Stanford University** **1850**
NASA graduate student researchers program
Period *Obligations*
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Franklin, G. F. HQ-XE/Owens, F. C. 45-Elec Engr

NSG 5131 **Stanford University** **1859**
Spectroscopy of cosmic X-ray sources of the solar corona
Period *Obligations*
11/15/76-12/31/89 FY89: \$255,000 TOTAL: \$2,140,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Walker, A. B. GSFC/Early, L. J. 13-Physics
Underwood, J. H. GSFC/Pless, R. H.

NGT 00-050-445 **Stanford University** **1851**
NASA graduate student researchers program
Period *Obligations*
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bradshaw, P. HQ-XE/Owens, F. C. 46-Mech Engr

NSG 7092 **Stanford University** **1860**
Energy release in solar flares based on OSO-5 data
Period *Obligations*
10/01/74-10/31/89 FY89: \$82,000 TOTAL: \$827,799
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Petrosian, V. HQ-ES/Bohlin, J. D. 11-Astronomy

NGT 00-050-488 **Stanford University** **1852**
NASA graduate student researchers program
Period *Obligations*
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hesselink, L. HQ-XE/Owens, F. C. 13-Physics

NAG 1-879 **University of California - Berkeley** **1861**
Requirements of wall gas interaction studies to be supported by tethered satellite
Period *Obligations*
05/01/88-04/30/90 FY89: \$45,923 TOTAL: \$70,841
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hurlbut, F. C. LARC/Wood, G. M. 41-Aero Engr

NGT 00-050-511 **Stanford University** **1853**
NASA graduate student researchers program
Period *Obligations*
09/01/89-08/31/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Franklin, G. F. HQ-XE/Owens, F. C. 46-Mech Engr

NAG 2-208 **University of California - Berkeley** **1862**
Spectroscopic observation of infrared lines normally obscured by atmospheric absorption
Period *Obligations*
11/01/82-10/31/89 FY89: \$127,500 TOTAL: \$833,990
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Townes, C. H. ARC/Haughney, L. C. 11-Astronomy
Genzel, R.

NGT 00-070-016 **Stanford University** **1854**
Graduate student researchers underrepresented minority focus program
Period *Obligations*
04/01/87-03/31/89 FY89: TOTAL: \$34,138
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Banks, P. M. HQ-LE/Owens, F. C. 41-Aero Engr

NAG 2-243 **University of California - Berkeley** **1863**
Control systems design methodologies in a computer aided design environment
Period *Obligations*
10/01/83-09/30/89 FY89: \$100,000 TOTAL: \$456,780
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Sastry, S. S. ARC/Meyer, G. 49-Engr, NEC
Desoer, C.
Polak, E.

NGT 00-070-056 **Stanford University** **1855**
NASA graduate student researchers program
Period *Obligations*
09/25/87-09/24/90 FY89: \$36,003 TOTAL: \$54,003
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Eshleman, V. R. HQ-XE/Owens, F. C. 45-Elec Engr

**NASA'S UNIVERSITY PROGRAM
CALIFORNIA (Continued)**

NAG 2-254 University of California - Berkeley 1864
A multi-transition study of excited CO from molecular cloud cores with a 200 m-500 m heterodyne spectrometer

Period	Obligations	
10/01/83-09/30/89	FY89: \$92,000	TOTAL: \$536,900
Prin. Invest.	NASA Tech. Officer	CASE Category
Betz, A. L.	ARC/Haughney, L. C.	11-Astronomy

NAG 2-378 University of California - Berkeley 1865
The control of turbulent mixing layer and the dynamics of small scales

Period	Obligations	
10/01/85-09/30/88	FY89:	TOTAL: \$66,094
Prin. Invest.	NASA Tech. Officer	CASE Category
Corcos, G. M.	ARC/Davis, S.	41-Aero Engr

NAG 2-393 University of California - Berkeley 1866
Measurements of the spatial structure and directivity of 100 keV photon sources in solar flares using PVO and ISEE 3 spacecraft

Period	Obligations	
04/01/86-03/31/90	FY89:	TOTAL: \$76,800
Prin. Invest.	NASA Tech. Officer	CASE Category
Anderson, K.	ARC/Lasher, L. E.	11-Astronomy
	ARC/Fimmel, R. O.	

NAG 2-448 University of California - Berkeley 1867
Micromotional studies of utricular and canal afferents

Period	Obligations	
01/01/87-12/31/89	FY89: \$48,500	TOTAL: \$149,380
Prin. Invest.	NASA Tech. Officer	CASE Category
Lewis, E. R.	ARC/Ross, M. D.	51-Biological Sci
	ARC/Holton, E. M.	

NAG 2-530 University of California - Berkeley 1868
Continuation of the POSTGRES project

Period	Obligations	
07/01/88-12/31/89	FY89: \$344,000	TOTAL: \$344,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Stonebraker, M. R.	ARC/Friedland, P. E.	22-Computer Science

NAG 2-572 University of California - Berkeley 1869
The role of calcite skeletal matrix proteins in biomineralization

Period	Obligations	
03/01/89-11/30/89	FY89: \$50,000	TOTAL: \$50,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Wilt, F. H.	ARC/Holton, E. M.	51-Biological Sci

NAG 2-591 University of California - Berkeley 1870
Diskless supercomputers scalable reliable I/O for the tera op technology base

Period	Obligations	
07/01/89-01/31/90	FY89: \$609,795	TOTAL: \$609,795
Prin. Invest.	NASA Tech. Officer	CASE Category
Katz, R. H.	ARC/Tweten, D. E.	22-Computer Science

NAG 3-146 University of California - Berkeley 1871
Surface tension phenomena under low and zero gravity conditions

Period	Obligations	
01/07/81-12/31/87	FY89:	TOTAL: \$330,477
Prin. Invest.	NASA Tech. Officer	CASE Category
Concus, P.	LERC/Chai, A. T.	13-Physics
Finn, R.		
Hesseling, B.		

NAG 3-443 University of California - Berkeley 1872
Fundamental study of smoldering with emphasis on experimental design for zero G

Period	Obligations	
06/30/83-11/30/90	FY89: \$105,000	TOTAL: \$355,529
Prin. Invest.	NASA Tech. Officer	CASE Category
Pagni, P. J.	LERC/Stocker, D. P.	49-Engr, NEC
Fernandez-pello, A. C.	LERC/Olson, S. L.	

NAG 3-857 University of California - Berkeley 1873
Spatial distribution of deep level in semiconductors

Period	Obligations	
01/01/88-12/31/90	FY89: \$6,974	TOTAL: \$23,968
Prin. Invest.	NASA Tech. Officer	CASE Category
Weber, E. R.	LERC/Bailey, S. G.	45-Elec Engr

NAG 3-861 University of California - Berkeley 1874
The effects of buoyancy on the stability of premixed laminar flows

Period	Obligations	
01/02/88-01/01/90	FY89: \$25,000	TOTAL: \$47,662
Prin. Invest.	NASA Tech. Officer	CASE Category
Pello, A. C.	LERC/Stocker, D. P.	46-Mech Engr

NAG 5-95 University of California - Berkeley 1875
Research relative to low noise amplifiers for radio astronomy

Period	Obligations	
09/01/80-03/31/90	FY89: \$75,000	TOTAL: \$526,435
Prin. Invest.	NASA Tech. Officer	CASE Category
Welch, W. J.	GSFC/Clark, T. A.	19-Phys Sci, NEC
Backer, D. C.	GSFC/Wildes, W. T.	

NAG 5-375 University of California - Berkeley 1876
Electric field studies

Period	Obligations	
10/01/83-09/30/89	FY89: \$180,000	TOTAL: \$1,060,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Mozer, F. S.	GSFC/Wales, R. O.	31-Atmos Sci
Cattell, C. A.		
Wygant, J. R.		

NAG 5-376 University of California - Berkeley 1877
Energetic particle and X-ray studies

Period	Obligations	
10/01/83-11/30/89	FY89: \$127,000	TOTAL: \$1,176,045
Prin. Invest.	NASA Tech. Officer	CASE Category
Anderson, K. A.	GSFC/Wales, R. O.	31-Atmos Sci
Lin, R. P.		
Kane, S.		

NAG 5-576 University of California - Berkeley 1878
Chromospheric activity in solar mass pre-main sequence stars

Period	Obligations	
06/15/85-10/14/87	FY89:	TOTAL: \$38,063
Prin. Invest.	NASA Tech. Officer	CASE Category
Basri, G. S.	GSFC/Kondo, Y.	11-Astronomy
Finkenzeller, U.		
Giampapa, M. S.		

NAG 5-646 University of California - Berkeley 1879
Spectroscopic observations of ultraviolet radiance coupling and energetics an interdisciplinary rocket program

Period	Obligations	
03/01/88-02/28/90	FY89: \$153,000	TOTAL: \$213,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Chakrabarti, S.	GSFC/Early, L. J.	13-Physics
	GSFC/Pless, R. H.	

NASA'S UNIVERSITY PROGRAM **CALIFORNIA (Continued)**

NAG 5-657 University of California - Berkeley 1880
Science and instrument design studies for the fast small Explorer mission

Period	Obligations	
07/01/89-06/30/90	FY89: \$100,000	TOTAL: \$100,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Carlson, C. W.	GSFC/Early, L. J.	13-Physics
	GSFC/Pless, R. H.	

NAG 5-1230 University of California - Berkeley 1888
Studies of the high-latitude interstellar medium

Period	Obligations	
09/01/89-12/31/89	FY89: \$8,500	TOTAL: \$8,500
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Heiles, C.	GSFC/West, D.	11-Astronomy

NAG 5-660 University of California - Berkeley 1881
Development of an imaging detector system

Period	Obligations	
09/01/89-08/31/90	FY89: \$30,000	TOTAL: \$30,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Chakrabarti, S.	GSFC/Early, L. J.	13-Physics
	GSFC/Pless, R. H.	

NAG 5-1243 University of California - Berkeley 1889
The dust properties of galactic high-mass star forming regions

Period	Obligations	
09/01/89-11/30/89	FY89: \$6,500	TOTAL: \$6,500
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Shu, F.	GSFC/West, D.	11-Astronomy

NAG 5-935 University of California - Berkeley 1882
Collaborative analysis of SMM vena and prognos solar X ray bursts

Period	Obligations	
08/01/87-07/31/90	FY89:	TOTAL: \$47,400
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hurley, K. C.	GSFC/Bullock, G. D.	19-Phys Sci, NEC
	GSFC/Gurman, J. B.	

NAG 6-10 University of California - Berkeley 1890
Sounding rocket research program

Period	Obligations	
11/01/80-10/31/89	FY89: \$260,000	TOTAL: \$2,049,249
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Carlson, C. W.	GSFC/Early, L. J.	19-Phys Sci, NEC
Mozer, F. S.	GSFC/Pless, R. H.	
Anderson, K. A.		

NAG 5-959 University of California - Berkeley 1883
Scientific definition study for the electron reflectometer addition to the magnetic fields investigation on the Mars observe mission

Period	Obligations	
08/01/87-12/14/89	FY89: \$197,667	TOTAL: \$447,667
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Lin, R. P.	GSFC/Acuna, M. H.	13-Physics

NAG 8-679 University of California - Berkeley 1891
Increasing HRI detections of IPC sources

Period	Obligations	
08/01/87-07/31/88	FY89:	TOTAL: \$4,891
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
McKee, C. F.	MSFC/Harper, B. A.	11-Astronomy

NAG 5-1062 University of California - Berkeley 1884
Disk activity in T Tauri stars

Period	Obligations	
08/01/88-08/31/90	FY89: \$25,025	TOTAL: \$50,725
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Basri, G.	GSFC/West, D.	11-Astronomy

NAG 8-680 University of California - Berkeley 1892
Objective grating X ray spectroscopy of compact binary sources

Period	Obligations	
08/15/87-08/14/89	FY89:	TOTAL: \$60,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Kahn, S. M.	MSFC/Harper, B. A.	11-Astronomy
Goldstien, W. H.		

NAG 5-1123 University of California - Berkeley 1885
Astromog superconducting magnet and cyrostat support

Period	Obligations	
03/01/89-12/31/89	FY89: \$210,000	TOTAL: \$210,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Smoot, G. F.	GSFC/Ormes, J. F.	11-Astronomy

NAG 9-34 University of California - Berkeley 1893
Isotopic studies in meteorites lunar samples

Period	Obligations	
02/01/83-02/01/89	FY89:	TOTAL: \$971,700
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Reynolds, J. H.	JSC/Browne, I. D.	13-Physics

NAG 5-1170 University of California - Berkeley 1886
Ultraviolet observations of a bright southern quasar

Period	Obligations	
07/15/89-07/14/90	FY89: \$11,100	TOTAL: \$11,100
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Davis, M.	GSFC/West, D. K.	11-Astronomy

NAGW 66 University of California - Berkeley 1894
Microwave and theoretical studies related to the COBE satellite mission

Period	Obligations	
07/01/80-02/28/90	FY89: \$25,000	TOTAL: \$230,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Smoot, G. F.	HQ-EZ/Gillett, F. C.	11-Astronomy
	HQ-EZ/Weiler, E. J.	

NAG 5-1171 University of California - Berkeley 1887
Ultraviolet observations of the least luminous and nearest known Seyfert 1 nucleus

Period	Obligations	
07/15/89-07/14/90	FY89: \$5,600	TOTAL: \$5,600
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Filippenko, A. V.	GSFC/West, D. K.	11-Astronomy

NAGW 239 University of California - Berkeley 1895
Geotropic stimulus production in roots of corn

Period	Obligations	
08/01/81-10/31/89	FY89: \$50,000	TOTAL: \$374,569
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Feldman, L. J.	HQ-EB/Halstead, T. W.	51-Biological Sci

NASA'S UNIVERSITY PROGRAM CALIFORNIA (Continued)

NAGW 270 University of California - Berkeley 1896
Quantitative spectroscopy of comets
Period *Obligations*
12/01/81-11/30/90 FY89: \$74,128 TOTAL: \$322,002
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Spinrad, H. HQ-EL/Brinton, H. C. 11-Astronomy
HQ-EL/Rahe, J. H.

NAGW 427 University of California - Berkeley 1897
Thioredoxin-linked enzyme regulative as a probe for studying the evolution of photosynthesis
Period *Obligations*
02/01/83-12/31/89 FY89: \$50,073 TOTAL: \$346,906
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Buchanan, B. B. HQ-EB/Fogleman, S. W. 51-Biological Sci
HQ-EB/Rummel, J. D.

NAGW 516 University of California - Berkeley 1898
Observational techniques for solar flare gamma-rays hard X-rays and neutrons
Period *Obligations*
11/01/83-11/30/88 FY89: TOTAL: \$578,651
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lin, R. P. HQ-EZ/Ahluwalia, H. S. 13-Physics
HQ-EZ/Bohlin, J. D.

NAGW 526 University of California - Berkeley 1899
Proposal to build a vastly improved data acquisition system for the Berkeley SETI program: Seren dip II
Period *Obligations*
01/01/84-07/31/89 FY89: \$16,250 TOTAL: \$126,400
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bowyer, C. S. HQ-EB/Rummel, J. D. 11-Astronomy
Tarter, J. HQ-EB/Averner, M.
Buitse, R.

NAGW 604 University of California - Berkeley 1900
Experimental studies pertaining to the nature of the Earth's cone
Period *Obligations*
04/15/84-09/30/89 FY89: \$78,800 TOTAL: \$309,349
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Jeanloz, R. HQ-EL/Underwood, J. 32-Geological Sci
HQ-EL/Boyce, J. M.

NAGW 681 University of California - Berkeley 1901
A directed search for laser signals at 10 UM
Period *Obligations*
11/15/84-11/14/89 FY89: \$56,000 TOTAL: \$267,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Betz, A. L. HQ-EB/Rummel, J. D. 13-Physics
HQ-EB/Averner, M.

NAGW 776 University of California - Berkeley 1902
Radial diffusion of energetic electrons in Jupiter's magnetosphere
Period *Obligations*
07/15/85-07/15/88 FY89: TOTAL: \$67,822
Prin. Invest. *NASA Tech. Officer* *CASE Category*
De Pater, I. HQ-EL/Fox, K. 13-Physics
HQ-EL/Quaide, W. L.

NAGW 868 University of California - Berkeley 1903
Assistance for the cosmic ray nuclei experiment/passive resolution extension package (CRNE/PREP)
Period *Obligations*
02/01/86-09/30/88 FY89: TOTAL: \$277,093
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Price, P. B. HQ-EZ/Jones, W. V. 11-Astronomy
HQ-EZ/Kaluzienski, L. J.

NAGW 881 University of California - Berkeley 1904
Development of EOS aided procedures for the determination of the water balance or hydrologic budget of a large watershed
Period *Obligations*
03/15/86-12/31/89 FY89: TOTAL: \$565,003
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Congalton, R. G. HQ-EE/Miller, T. L. 39-Env Sci, NEC
Thomas, R.
Zinke, P.

NAGW 1022 University of California - Berkeley 1905
Far infrared laser spectroscopy of ultracold carbon clusters and their relationship to interstellar dust
Period *Obligations*
02/15/87-02/14/89 FY89: TOTAL: \$250,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Saykally, R. J. HQ-E/Alexander, J. K. 19-Phys Sci, NEC
HQ-EP/Konkel, R. M.

NAGW 1240 University of California - Berkeley 1906
Development of a 4 steradian imaging detector for planetary electron magnetometry perm on the lunar observer
Period *Obligations*
01/01/88-12/31/89 FY89: TOTAL: \$58,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lin, R. P. HQ-EL/Evans, L. G. 19-Phys Sci, NEC
HQ-EL/Quaide, W. L.

NAGW 1290 University of California - Berkeley 1907
The photoemission characteristics of inorganic photocathodes for the extreme and the ultraviolet
Period *Obligations*
05/01/88-01/31/90 FY89: \$109,800 TOTAL: \$109,800
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Siegmund, O. H. HQ-EZ/Clayton, G. C. 11-Astronomy

NAGW 1298 University of California - Berkeley 1908
Giotto data analysis
Period *Obligations*
04/01/88-04/30/90 FY89: \$62,000 TOTAL: \$259,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lin, R. P. HQ-EL/Bergstralh, J. T. 11-Astronomy
HQ-EL/Quaide, W. L.

NAGW 1349 University of California - Berkeley 1909
Numerical simulations great red spot of Jupiter
Period *Obligations*
05/01/88-11/30/89 FY89: \$36,496 TOTAL: \$77,440
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Marcus, P. S. HQ-EL/Bergstralh, J. T. 46-Mech Engr
HQ-EL/Quaide, W. L.

NAGW 1352 University of California - Berkeley 1910
Rocket borne submillimeter wave astronomy
Period *Obligations*
05/01/88-19/30/89 FY89: \$87,800 TOTAL: \$177,800
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Richards, P. L. HQ-EZ/Gillett, F. C. 11-Astronomy

**NASA'S UNIVERSITY PROGRAM
CALIFORNIA (Continued)**

NAGW 1503 University of California - Berkeley 1911			
The systematic interpretation of cosmic ray data			
<i>Period</i>	<i>Obligations</i>		
11/01/88-10/31/89	FY89: \$130,000	TOTAL: \$130,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Crawford, H. J.	HQ-ES/Mellott, M. M.	13-Physics	
	HQ-ES/Jones, W. V.		
NAGW 1513 University of California - Berkeley 1912			
Collaborative analysis of Pioneer-Venus orbiter international cometary Explorer Solar Maximum Mission Venera and prognos cosmic gamma ray burst			
<i>Period</i>	<i>Obligations</i>		
12/01/88-11/30/89	FY89: \$47,500	TOTAL: \$47,500	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hurley, K. C.	HQ-EZ/Kaluzienski, L. J.	11-Astronomy	
	HQ-EZ/Bunner, A. N.		
NAGW 1521 University of California - Berkeley 1913			
The chemistry of living systems			
<i>Period</i>	<i>Obligations</i>		
11/01/88-10/31/89	FY89: \$44,000	TOTAL: \$44,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Jukes, T. H.	HQ-EB/Rummel, J. D.	51-Biological Sci	
NAGW 1565 University of California - Berkeley 1914			
The MHD and kinetic structure of discontinuities in the Earth's magnetotail using AMPTE IRM plasma data			
<i>Period</i>	<i>Obligations</i>		
02/01/89-01/31/90	FY89: \$75,000	TOTAL: \$75,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Carlson, C. W.	HQ-ES/Mellott, M. M.	13-Physics	
	HQ-ES/Perry, T. W.		
NAGW 1570 University of California - Berkeley 1915			
Laboratory modeling of magnetospheric particle accelerations currents and instabilities			
<i>Period</i>	<i>Obligations</i>		
03/01/89-02/28/90	FY89: \$65,000	TOTAL: \$65,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Stenzel, R. L.	HQ-ES/Mellott, M. M.	13-Physics	
	HQ-ES/Perry, T. W.		
NAGW 1597 University of California - Berkeley 1916			
Spaceborne infrared astronomy			
<i>Period</i>	<i>Obligations</i>		
02/01/89-01/31/90	FY89: \$135,000	TOTAL: \$135,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Lange, A. E.	HQ-EZ/Gillett, F. C.	11-Astronomy	
NAGW 1626 University of California - Berkeley 1917			
Nonlinear electrostatic effects on auroral field lines and at the magnetotail			
<i>Period</i>	<i>Obligations</i>		
01/01/89-12/31/89	FY89: \$60,000	TOTAL: \$60,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Mozer, F. S.	HQ-ES/Mellott, M. M.	13-Physics	
	HQ-ES/Perry, T. W.		
NAGW 1672 University of California - Berkeley 1918			
Innovative research at the space sciences laboratory			
<i>Period</i>	<i>Obligations</i>		
04/01/89-03/31/90	FY89: \$230,000	TOTAL: \$230,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
McKee, C. F.	HQ-E/Alexander, J. K.	11-Astronomy	
	HQ-E/Holland, D. A.		
NAGW 1735 University of California - Berkeley 1919			
Continuation of telescope testbed experiments at Berkeley			
<i>Period</i>	<i>Obligations</i>		
04/01/89-03/31/90	FY89: \$100,000	TOTAL: \$100,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Chakrabarti, S.	HQ-EZ/Weiss, J. R.	11-Astronomy	
	HQ-EC/Schmerling, E. R.		
NAGW 1795 University of California - Berkeley 1920			
Development of space plasma measurement techniques			
<i>Period</i>	<i>Obligations</i>		
08/01/89-07/31/90	FY89: \$100,000	TOTAL: \$100,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Anderson, K. A.	HQ-ES/Mellott, M. M.	13-Physics	
	HQ-ES/Perry, T. W.		
NAGW 1805 University of California - Berkeley 1921			
Radial diffusion in energetic electrons in Jupiter's magnetosphere			
<i>Period</i>	<i>Obligations</i>		
06/01/89-05/30/90	FY89: \$49,106	TOTAL: \$49,106	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Depater, I.	HQ-EL/Bergstralh, J. T.	11-Astronomy	
NAS 1-17806 University of California - Berkeley 1922			
Definition of science requirements for LDEF mission II heavy nuclei collection and for the demonstration of the HNC detector performance			
<i>Period</i>	<i>Obligations</i>		
09/28/84-04/30/90	FY89:	TOTAL: \$719,025	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Price, P. B.	LARC/O'neal, R. L.	11-Astronomy	
NAS 1-18686 University of California - Berkeley 1923			
Plasma arc welding in space			
<i>Period</i>	<i>Obligations</i>		
06/09/88-06/08/90	FY89:	TOTAL: \$132,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Rubinsky, B.	LARC/Clark, L. G.	42-Astro Engr	
	LARC/Buckley, J. D.		
NAS 5-26847 University of California - Berkeley 1924			
Study of electric field instruments for the open polar plasma laboratory (PPL) and geomagnetic tail laboratory (GTL) satellites			
<i>Period</i>	<i>Obligations</i>		
05/07/82-07/31/89	FY89:	TOTAL: \$694,179	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Mozer, F. S.	GSFC/Wainscott, F. H.	13-Physics	
NAS 5-26855 University of California - Berkeley 1925			
Definition study of 3-D plasma and energetic particle distribution under the OPEN (origin of plasmas in the Earth's neighborhood project)			
<i>Period</i>	<i>Obligations</i>		
05/08/82-08/31/89	FY89:	TOTAL: \$1,139,787	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Lin, R. P.	GSFC/Wainscott, F.	13-Physics	
NAS 5-27592 University of California - Berkeley 1926			
Cosmic Background Explorer (COBE) project science participation			
<i>Period</i>	<i>Obligations</i>		
05/01/83-12/31/89	FY89: \$230,000	TOTAL: \$1,459,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Smoot, G. F.	GSFC/Mather, J. C.	11-Astronomy	
	GSFC/Nicholson, L. W.		

NASA'S UNIVERSITY PROGRAM **CALIFORNIA (Continued)**

NAS 5-28086 University of California - Berkeley 1927
 Continued ST science instrument team support for faint object camera (FOC) instrument
Period *Obligations*
 03/13/84-09/30/92 FY89: \$183,000 TOTAL: \$647,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 King, I. GSFC/Kalinowski, J. K. 11-Astronomy

NAS 5-29298 University of California - Berkeley 1928
 Extreme ultraviolet Explorer project
Period *Obligations*
 06/19/86-09/30/91 FY89: \$8,158,782 TOTAL: \$25,365,507
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Malina, R. GSFC/Schultz, D. 11-Astronomy

NAS 5-30180 University of California - Berkeley 1929
 Science effort associated with the EUVE
Period *Obligations*
 05/01/87-09/30/91 FY89: \$1,891,000 TOTAL: \$2,799,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Hunten, D. GSFC/Smith, A. 11-Astronomy

NAS 5-30241 University of California - Berkeley 1930
 Electric fields investigation for ISTP geotail spacecraft
Period *Obligations*
 01/07/88-09/30/93 FY89: \$28,000 TOTAL: \$82,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Mozer, F. S. GSFC/Wainscott, F. 13-Physics

NAS 5-30366 University of California - Berkeley 1931
 3 D plasma analyzer experiment
Period *Obligations*
 02/16/89-06/30/95 FY89: \$1,910,000 TOTAL: \$1,910,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Lin, R. GSFC/Wainscott, F. 13-Physics

NAS 5-30367 University of California - Berkeley 1932
 Hardware phase of the electric field investigation
Period *Obligations*
 02/16/89-06/30/95 FY89: \$1,900,000 TOTAL: \$1,900,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Mozer, F. S. GSFC/Wainscott, F. H. 13-Physics

NAS 5-30396 University of California - Berkeley 1933
 Definition phase effort for the spherical double probe electric field investigation for the cluster mission
Period *Obligations*
 02/22/89-10/31/89 FY89: \$492,639 TOTAL: \$492,639
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Mozer, F. S. GSFC/Stich, K. 13-Physics

NAS 8-32577 University of California - Berkeley 1934
 Spacelab mission 1 experiment 95 far UV observations using the Faust instrument on the first Spacelab mission
Period *Obligations*
 05/10/77-04/30/92 FY89: \$707,000 TOTAL: \$3,273,653
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Bowyer, S. MSFC/Harwell, R. 31-Atmos Sci
 Lampton, M. MSFC/Eady, R.

NAS 8-37687 University of California - Berkeley 1935
 Definition of a high resolution gamma ray and hard X ray spectrometer hiregs for the max 91 solar balloon program
Period *Obligations*
 06/05/89-10/04/89 FY89: \$200,000 TOTAL: \$200,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Lin, R. P. MSFC/Reichmann, E. J. 31-Atmos Sci
 MSFC/Davis, J. M.

NASW 4099 University of California - Berkeley 1936
 Large format photon counting UV detectors for space astronomy
Period *Obligations*
 09/01/85-03/31/88 FY89: TOTAL: \$253,630
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Lampton, M. L. HQ-EZ/Weiler, E. J. 11-Astronomy
 HQ-EZ/Bogges, N.

NAS13-375 University of California - Berkeley 1937
 An evaluation of current and recommendations for future uses of remotely sensed data for commercial forest inventory
Period *Obligations*
 11/23/88-09/30/90 FY89: \$217,490 TOTAL: \$217,490
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Biging, G. S. SSC/Hill, C. L. 39-Env Sci, NEC
 Congalton, R. G.

NCA 2-64 University of California - Berkeley 1938
 Evolution of magnetic molecular clouds
Period *Obligations*
 08/01/85-02/29/88 FY89: TOTAL: \$77,114
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Shu, F. H. ARC/Cassen, P. 11-Astronomy

NCA 2-67 University of California - Berkeley 1939
 Effects of shock waves in regions of star formation (joint research interchange)
Period *Obligations*
 08/01/85-07/31/88 FY89: TOTAL: \$80,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 McKee, C. ARC/Hollenbach, D. 11-Astronomy

NCA 2-126 University of California - Berkeley 1940
 Interstellar grain chemistry
Period *Obligations*
 06/15/86-06/14/88 FY89: TOTAL: \$80,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 McKee, C. ARC/Hollenbach, D. 11-Astronomy

NCA 2-128 University of California - Berkeley 1941
 Measurement and characterization of computer performance
Period *Obligations*
 06/01/86-12/31/88 FY89: TOTAL: \$79,981
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Smith, A. J. ARC/Stevens, K. G. 22-Computer Science

NCA 2-140 University of California - Berkeley 1942
 The formation stability and permeability of membranes derived from protobiological molecules
Period *Obligations*
 08/01/86-07/31/88 FY89: TOTAL: \$74,551
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Packer, L. ARC/MacElroy, R. D. 51-Biological Sci
 Mehlnhorn, R.
 Pohorille, A.

**NASA'S UNIVERSITY PROGRAM
CALIFORNIA (Continued)**

NCA 2-209 University of California - Berkeley 1943
Interaction between a supersonic plume and a base flow region
Period *Obligations*
05/15/87-05/14/89 FY89: TOTAL: \$69,136
Prin. Invest. NASA Tech. Officer CASE Category
Holt, M. ARC/Holst, T. L. 46-Mech Engr
ARC/Chaussee, D. S.

NCA 2-227 University of California - Berkeley 1944
Optical and near infrared properties of elliptical galaxies as a function of environment and redshift
Period *Obligations*
07/01/87-12/31/88 FY89: TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
Spinrad, H. ARC/Werner, M. 11-Astronomy

NCA 2-240 University of California - Berkeley 1945
Prototype 3HE refrigerators for space applications
Period *Obligations*
08/01/87-01/31/90 FY89: TOTAL: \$50,000
Prin. Invest. NASA Tech. Officer CASE Category
Lange, A. ARC/Kittel, P. 19-Phys Sci, NEC

NCA 2-249 University of California - Berkeley 1946
Investigation of flow at high angles of attack and shock high flow interaction
Period *Obligations*
07/01/87-06/30/89 FY89: \$30,000 TOTAL: \$80,000
Prin. Invest. NASA Tech. Officer CASE Category
Holt, M. ARC/Deiwert, G. S. 46-Mech Engr

NCA 2-270 University of California - Berkeley 1947
Coagulation of small dust grains in the early solar nebula
Period *Obligations*
12/01/87-11/30/88 FY89: TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
McKee, C. ARC/Allamandola, L. J. 11-Astronomy

NCA 2-275 University of California - Berkeley 1948
Turbulence modelling for interaction of an oblique shock wave with supersonic flows past a cowl lip
Period *Obligations*
12/01/87-11/30/88 FY89: TOTAL: \$15,000
Prin. Invest. NASA Tech. Officer CASE Category
Holt, M. ARC/Chaussee, D. 46-Mech Engr

NCA 2-277 University of California - Berkeley 1949
Transfer of resonance line radiation in interstellar shock waves
Period *Obligations*
01/01/88-06/30/89 FY89: TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
McKee, C. ARC/Hollenbach, D. 11-Astronomy

NCA 2-279 University of California - Berkeley 1950
The spatial distribution of the infrared radiation from reflection nebulae
Period *Obligations*
01/01/88-12/31/89 FY89: \$30,000 TOTAL: \$51,000
Prin. Invest. NASA Tech. Officer CASE Category
Cohen, M. ARC/Werner, M. W. 11-Astronomy
Heiles, C. ARC/Allamandola, L. J.

NCA 2-280 University of California - Berkeley 1951
Analysis of CSRDF data with concomitant development of tactics expert functions
Period *Obligations*
01/01/88-12/31/89 FY89: TOTAL: \$35,245
Prin. Invest. NASA Tech. Officer CASE Category
Young, L. R. ARC/Bucher, N. M. 69-Psych, NEC
Agogino, A. ARC/Huff, E. M.

NCA 2-281 University of California - Berkeley 1952
The interaction of astrophysical jets with their environment
Period *Obligations*
01/01/88-12/31/89 FY89: TOTAL: \$80,000
Prin. Invest. NASA Tech. Officer CASE Category
Klein, R. ARC/Smith, B. F. 19-Phys Sci, NEC

NCA 2-334 University of California - Berkeley 1953
Excitation of the OH radical in an ozone hydrogen flame
Period *Obligations*
09/01/88-08/31/89 FY89: TOTAL: \$9,916
Prin. Invest. NASA Tech. Officer CASE Category
Davis, S. P. ARC/Valero, F. P. 11-Astronomy

NCA 2-342 University of California - Berkeley 1954
Instrumentation for high atmosphere experiments in the Berkeley low pressure wind tunnel
Period *Obligations*
07/01/88-04/30/90 FY89: \$40,000 TOTAL: \$70,000
Prin. Invest. NASA Tech. Officer CASE Category
Hurlbut, F. C. ARC/Deiwert, G. S. 41-Aero Engr
Holt, P. M.

NCA 2-412 University of California - Berkeley 1955
Simulations of light scattering in planetary rings
Period *Obligations*
06/14/89-09/01/89 FY89: \$10,959 TOTAL: \$10,959
Prin. Invest. NASA Tech. Officer CASE Category
Shu, F. H. ARC/Cuzzi, J. N. 11-Astronomy

NCA 2-419 University of California - Berkeley 1956
Experimental investigation of supersonic flow fields using laser holography joint research interchange
Period *Obligations*
07/01/89-06/31/91 FY89: \$36,919 TOTAL: \$36,919
Prin. Invest. NASA Tech. Officer CASE Category
Holt, M. ARC/Deiwert, G. S. 46-Mech Engr

NCA 2-423 University of California - Berkeley 1957
An iterative image rectification scheme for observational astronomy
Period *Obligations*
08/01/89-07/31/90 FY89: \$8,000 TOTAL: \$8,000
Prin. Invest. NASA Tech. Officer CASE Category
Welch, W. J. ARC/Hollenbach, D. 42-Astro Engr

NCA 2-446 University of California - Berkeley 1958
An exploratory investigation of an oscillating flap experiment in a small supersonic wind tunnel
Period *Obligations*
08/01/89-07/31/90 FY89: \$15,900 TOTAL: \$15,900
Prin. Invest. NASA Tech. Officer CASE Category
Holt, M. ARC/Strawa, A. 46-Mech Engr

NASA'S UNIVERSITY PROGRAM CALIFORNIA (Continued)

NCA 2-451 University of California - Berkeley 1959
A flow visualization and heat transfer study of the flow within tile gaps on AFE

Period	Obligations	TOTAL
10/01/89-07/31/90	FY89: \$7,000	\$7,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Eibeck, P.	ARC/White, S.	46-Mech Engr

NCC 2-36 University of California - Berkeley 1960
Selected target search for extra-terrestrial intelligence observations using very long base interferometry techniques and pattern recognition studies

Period	Obligations	TOTAL
10/16/79-09/30/89	FY89: \$89,054	\$587,010
Prin. Invest.	NASA Tech. Officer	CASE Category
Shu, F.	ARC/Jones, H. W.	99-Multi-Discip
Tarter, J.	ARC/Billingham, J.	

NCC 2-86 University of California - Berkeley 1961
Flight management systems

Period	Obligations	TOTAL
06/01/80-01/31/90	FY89: \$421,280	\$1,312,645
Prin. Invest.	NASA Tech. Officer	CASE Category
Stark, L.	ARC/Ellis, S. R.	99-Multi-Discip

NCC 2-142 University of California - Berkeley 1962
Detection, identification, and precise location of infrared objects

Period	Obligations	TOTAL
07/01/81-09/30/91	FY89: \$124,579	\$581,145
Prin. Invest.	NASA Tech. Officer	CASE Category
Heiles, C. E.	ARC/Wittenborn, F. C.	11-Astronomy
Cohen, M.	ARC/Goovitch, D.	

NCC 2-275 University of California - Berkeley 1963
Application of fuzzy logic to systems analysis and control

Period	Obligations	TOTAL
10/01/83-09/30/89	FY89: \$100,000	\$497,173
Prin. Invest.	NASA Tech. Officer	CASE Category
Zadeh, L.	ARC/Friedland, P. E.	22-Computer Science

NCC 2-548 University of California - Berkeley 1964
Star formation and the evolution of elliptical galaxies

Period	Obligations	TOTAL
07/01/88-04/30/90	FY89: \$249,000	\$475,311
Prin. Invest.	NASA Tech. Officer	CASE Category
Shu, F. H.	ARC/Hollenbach, D. J.	11-Astronomy
	ARC/Casser, P.	

NCC 2-550 University of California - Berkeley 1965
Research on computer system benchmarking

Period	Obligations	TOTAL
08/01/88-10/31/89	FY89: \$39,515	\$69,515
Prin. Invest.	NASA Tech. Officer	CASE Category
Smith, A. J.	ARC/Stevens, K. G.	22-Computer Science

NCC 2-626 University of California - Berkeley 1966
Convergence acceleration of iterative methods applied to hypersonic flow problems

Period	Obligations	TOTAL
05/01/89-04/30/90	FY89: \$20,995	\$20,995
Prin. Invest.	NASA Tech. Officer	CASE Category
Cheer, A. Y.	ARC/Flores, J.	41-Aero Engr

NCC 2-635 University of California - Berkeley 1967
An investigation of ballistic range technology and hypervelocity nozzles

Period	Obligations	TOTAL
09/01/89-08/31/90	FY89: \$35,000	\$35,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Holt, M.	ARC/Strawa, A. W.	41-Aero Engr
Chapman, S. T.		

NGL 05-003-017 University of California - Berkeley 1968
Investigation of high energy solar flare radiation and trapped radiation, including balloon-borne and sounding rocket tests of prototype detectors

Period	Obligations	TOTAL
04/08/63-07/31/89	FY89: \$80,000	\$2,761,841
Prin. Invest.	NASA Tech. Officer	CASE Category
Anderson, K. A.	HQ-ES/Mellott, M. M.	19-Phys Sci, NEC
Kane, S.	HQ-EE/Eastman, T. E.	

NGL 05-003-497 University of California - Berkeley 1969
Research in space sciences

Period	Obligations	TOTAL
04/05/72-03/31/89	FY89:	\$3,740,000
Prin. Invest.	NASA Tech. Officer	CASE Category
McKee, C. F.	HQ-E/Alexander, J. A.	13-Physics
	HQ-EP/Konkel, R. M.	

NGR 05-003-376 University of California - Berkeley 1970
High resolution studies of cosmic rays and solar particles

Period	Obligations	TOTAL
04/16/71-10/31/89	FY89: \$178,919	\$1,960,819
Prin. Invest.	NASA Tech. Officer	CASE Category
Price, P. B.	HQ-ES/Mellott, M. M.	11-Astronomy
Tarle, G.	HQ-ES/Perry, T. W.	

NGR 05-003-450 University of California - Berkeley 1971
Study of X-ray emission from galactic and extragalactic sources with emphasis on soft and ultra-soft wavelengths

Period	Obligations	TOTAL
05/28/71-11/30/89	FY89: \$2,075,000	\$5,944,114
Prin. Invest.	NASA Tech. Officer	CASE Category
Bowyer, C. S.	GSFC/Early, L. J.	11-Astronomy
	GSFC/Pless, R. H.	

NGR 05-003-460 University of California - Berkeley 1972
The chemistry of living systems

Period	Obligations	TOTAL
07/21/71-10/31/88	FY89:	\$1,348,049
Prin. Invest.	NASA Tech. Officer	CASE Category
Jukes, J. H.	HQ-EB/Rummel, J. D.	12-Chemistry
Bush, J. W.	HQ-EB/Averner, M.	

NGR 05-003-513 University of California - Berkeley 1973
Heavy ion fragment experiments at the bevatron

Period	Obligations	TOTAL
10/01/73-10/31/88	FY89:	\$1,783,270
Prin. Invest.	NASA Tech. Officer	CASE Category
Crawford, H. J.	HQ-ES/Mellott, M. M.	11-Astronomy
Greiner, D. E.	HQ-EZ/Kaluzienski, L. J.	

NGR 05-003-578 University of California - Berkeley 1974
Theoretical X-ray and gamma-ray astronomy

Period	Obligations	TOTAL
08/01/73-10/31/89	FY89: \$55,000	\$679,439
Prin. Invest.	NASA Tech. Officer	CASE Category
Silk, J. I.	HQ-EZ/Gillett, F. C.	11-Astronomy
	HQ-EZ/Stachnik, R. V.	

**NASA'S UNIVERSITY PROGRAM
CALIFORNIA (Continued)**

NGT 00-050-014 University of California - Berkeley 1975
NASA graduate student researchers program
Period *Obligations*
06/01/86-12/31/88 FY89 TOTAL: \$46,500
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Price, P. B. HQ-LE/Owens, F. C. 13-Physics

NGT 00-050-271 University of California - Berkeley 1984
NASA graduate student researchers program
Period *Obligations*
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Larson, D. E. HQ-XE/Owens, F. C. 13-Physics
Anderson, K. A. HQ-ES/Eastman, T.

NGT 00-050-017 University of California - Berkeley 1976
NASA graduate student researchers program
Period *Obligations*
08/01/86-07/31/89 FY89: TOTAL: \$52,575
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Feldman, L. J. HQ-LE/Owens, F. C. 51-Biological Sci

NGT 00-050-278 University of California - Berkeley 1985
NASA graduate student researchers program
Period *Obligations*
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$35,800
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Townes, C. H. HQ-XE/Owens, F. C. 55-Agriculture Sci

NGT 00-050-018 University of California - Berkeley 1977
NASA graduate student researchers program
Period *Obligations*
06/01/86-08/31/89 FY89: TOTAL: \$52,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Betz, A. L. HQ-LE/Owens, F. C. 13-Physics

NGT 00-050-293 University of California - Berkeley 1986
NASA graduate student researchers program
Period *Obligations*
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Feldman, L. J. HQ-XE/Owens, F. C. 19-Phys Sci, NEC

NGT 00-050-022 University of California - Berkeley 1978
NASA graduate student researchers program
Period *Obligations*
06/01/86-05/31/89 FY89: TOTAL: \$52,350
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Sadoulet, B. HQ-LE/Owens, F. C. 13-Physics

NGT 00-050-312 University of California - Berkeley 1987
NASA graduate student researchers program
Period *Obligations*
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$35,800
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lange, A. E. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-037 University of California - Berkeley 1979
NASA graduate student researchers program
Period *Obligations*
06/01/86-08/31/88 FY89: TOTAL: \$31,878
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Haller, E. F. HQ-LE/Owens, F. C. 47-Materials Engr

NGT 00-050-313 University of California - Berkeley 1988
NASA graduate student researchers program
Period *Obligations*
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$35,600
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Anderson, K. A. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-166 University of California - Berkeley 1980
NASA graduate student researchers program
Period *Obligations*
06/01/87-05/31/90 FY89: \$18,000 TOTAL: \$47,803
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Russell, S. J. HQ-XE/Owens, F. C. 22-Computer Science

NGT 00-050-385 University of California - Berkeley 1989
NASA graduate student researchers program
Period *Obligations*
08/01/88-07/31/89 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Daily, J. HQ-XE/Owens, F. C. 46-Mech Engr
HQ-XE/Counts, J.

NGT 00-050-178 University of California - Berkeley 1981
NASA graduate student researchers program
Period *Obligations*
06/01/87-05/31/89 FY89: TOTAL: \$35,300
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Mozer, F. C. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-450 University of California - Berkeley 1990
NASA graduate student researchers program
Period *Obligations*
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Sutton, E. C. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-179 University of California - Berkeley 1982
NASA graduate student researchers program
Period *Obligations*
06/01/87-05/31/90 FY89: \$36,000 TOTAL: \$71,900
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Richards, P. L. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-451 University of California - Berkeley 1991
NASA graduate student researchers program
Period *Obligations*
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Mozer, F. S. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-185 University of California - Berkeley 1983
NASA graduate student researchers program
Period *Obligations*
06/01/87-05/31/89 FY89: TOTAL: \$35,800
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bowyer, C. S. HQ-XE/Owens, F. C. 11-Astronomy

NGT 00-050-452 University of California - Berkeley 1992
NASA graduate student researchers program
Period *Obligations*
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Chakrabarti, S. HQ-XE/Owens, F. C. 13-Physics

NASA'S UNIVERSITY PROGRAM **CALIFORNIA (Continued)**

NGT 00-050-454 University of California - Berkeley 1993
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Price, P. B. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-462 University of California - Berkeley 1994
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Sadoulet, B. HQ-XE/Owens, F. C. 12-Chemistry

NGT 00-050-467 University of California - Berkeley 1995
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Kahn, S. M. HQ-XE/Owens, F. C. 13-Physics

NGT 00-070-034 University of California - Berkeley 1996
Graduate student researchers underrepresented minority focus program
Period Obligations
08/01/87-08/31/89 FY89: \$36,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Stark, L. HQ-XE/Owens, F. C. 13-Physics

NGT 00-070-074 University of California - Berkeley 1997
Graduate student researchers underrepresented minority focus program
Period Obligations
01/01/88-12/31/89 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Weber, E. R. HQ-XE/Owens, F. C. 47-Materials Engr

NSG 7205 University of California - Berkeley 1998
Far infrared all-sky survey
Period Obligations
02/01/76-04/30/90 FY89: \$95,000 TOTAL: \$960,500
Prin. Invest. NASA Tech. Officer CASE Category
Richards, P. L. HQ-EZ/Gillett, F. C. 11-Astronomy
HQ-EZ/Weiler, E. J.

NAG 1-669 University of California - Davis 1999
Advanced computational methods for aerodynamics
Period Obligations
04/16/86-02/28/90 FY89: \$59,974 TOTAL: \$285,143
Prin. Invest. NASA Tech. Officer CASE Category
Hafez, M. M. LARC/Salas, M. D. 41-Aero Engr
LARC/Keller, J. D.

NAG 2-221 University of California - Davis 2000
Modeling pilot interaction with automated digital avionics systems
Period Obligations
01/01/83-12/31/89 FY89: \$248,419 TOTAL: \$248,419
Prin. Invest. NASA Tech. Officer CASE Category
Hess, R. A. ARC/Cheng, V. H. 41-Aero Engr
ARC/Legacqz, J. V.

NAG 2-341 University of California - Davis 2001
The effects of hypergravic fields on neural processing of sensory thermoregulatory and vestibular systems in the rat
Period Obligations
03/01/85-12/31/88 FY89: \$112,561 TOTAL: \$112,561
Prin. Invest. NASA Tech. Officer CASE Category
Horowitz, J. M. ARC/Holton, E. M. 51-Biological Sci
Horwitz, B. A.

NAG 2-349 University of California - Davis 2002
Homeostasis in primates in hyperacceleration fields
Period Obligations
04/01/85-05/31/89 FY89: \$40,000 TOTAL: \$392,800
Prin. Invest. NASA Tech. Officer CASE Category
Fuller, C. A. ARC/Holton, E. 51-Biological Sci

NAG 2-428 University of California - Davis 2003
Space station aesthetics a study of arousal preference and attitude
Period Obligations
12/01/86-06/30/90 FY89: \$60,000 TOTAL: \$60,000
Prin. Invest. NASA Tech. Officer CASE Category
Coss, R. G. ARC/Clearwater, Y. A. 69-Psych, NEC

NAG 2-467 University of California - Davis 2004
Squirrel monkey requirements for chronic acceleration research
Period Obligations
08/01/87-09/30/89 FY89: \$80,881 TOTAL: \$145,881
Prin. Invest. NASA Tech. Officer CASE Category
Fuller, C. A. ARC/Winget, C. M. 54-Env Biology
ARC/Ballard, R. W.

NAG 2-482 University of California - Davis 2005
Techniques for the assessment of manned flight simulator fidelity
Period Obligations
10/01/87-09/30/90 FY89: \$39,822 TOTAL: \$68,553
Prin. Invest. NASA Tech. Officer CASE Category
Hess, R. A. ARC/Bray, R. S. 41-Aero Engr
Malsbury, T. N. ARC/Atencio, A.

NAG 2-490 University of California - Davis 2006
Predicting pilot induced oscillations using the optimal control model of the human pilot
Period Obligations
10/01/87-09/30/90 FY89: \$28,919 TOTAL: \$56,059
Prin. Invest. NASA Tech. Officer CASE Category
Hess, R. A. ARC/Berry, D. T. 41-Aero Engr

NAG 2-562 University of California - Davis 2007
Thermoregulation in primates in the space environment
Period Obligations
10/01/88-04/30/89 FY89: \$219,999 TOTAL: \$219,999
Prin. Invest. NASA Tech. Officer CASE Category
Fuller, C. A. ARC/Winget, C. M. 54-Env Biology
ARC/Ballard, R. W.

NAG 2-587 University of California - Davis 2008
Biological rhythms and temperature regulation in rhesus monkeys during spaceflight
Period Obligations
06/01/89-02/28/90 FY89: \$83,000 TOTAL: \$83,000
Prin. Invest. NASA Tech. Officer CASE Category
Fuller, C. A. ARC/Connolly, J. P. 51-Biological Sci
ARC/Ballard, R. W.

**NASA'S UNIVERSITY PROGRAM
CALIFORNIA (Continued)**

NAG 3-667	University of California - Davis	2009	Probability density functions for reacting turbulent flows
<i>Period</i>	<i>Obligations</i>		
01/30/86-12/31/88	FY89:	TOTAL: \$91,354	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Kollman, W.	LERC/Vanoverbeke, T.	46-Mech Engr	
NAG 3-836	University of California - Davis	2010	Pdf closure model for compressible turbulent chemically reacting flows
<i>Period</i>	<i>Obligations</i>		
01/01/88-12/31/90	FY89:	TOTAL: \$100,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Kollman, W.	LERC/Claus, R. W.	41-Aero Engr	
NAG 3-1007	University of California - Davis	2011	Modulation techniques for power
<i>Period</i>	<i>Obligations</i>		
03/01/89-03/01/90	FY89: \$44,000	TOTAL: \$44,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Feher, K.	LERC/Budinger, J. M.	45-Elec Engr	
	LERC/Harrod, J. L.		
NAG 5-937	University of California - Davis	2012	Modeling of vegetation atmosphere interactions for life
<i>Period</i>	<i>Obligations</i>		
07/15/87-01/31/90	FY89: \$16,000	TOTAL: \$53,205	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Paw U, K. T.	GSFC/Toll, D. L.	39-Env Sci, NEC	
Sellers, P. J.	GSFC/Hall, F.		
NAGW 903	University of California - Davis	2013	Laser studies of the photodissociation dynamics for the formation of cometary radicals
<i>Period</i>	<i>Obligations</i>		
06/01/86-11/30/89	FY89: \$28,000	TOTAL: \$184,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Jackson, W. M.	HQ-EL/Bergstrahl, J. T.	31-Atmos Sci	
	HQ-EL/Quaide, W. L.		
NAGW 1119	University of California - Davis	2014	Role of prebiotic amphiphilic molecules in evolution of membrane structure
<i>Period</i>	<i>Obligations</i>		
06/01/87-11/30/89	FY89: \$31,410	TOTAL: \$142,953	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Deamer, D. W.	HQ-EB/Rummel, J. D.	12-Chemistry	
NAGW 1144	University of California - Davis	2015	Laboratory simulation of the surface of Halley's comet
<i>Period</i>	<i>Obligations</i>		
07/01/87-12/31/89	FY89: \$34,000	TOTAL: \$85,699	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Jackson, W. M.	HQ-EL/Brinton, H. C.	11-Astronomy	
	HQ-EL/Rahe, J. H.		
NAGW 1458	University of California - Davis	2016	The effects of gravitational fields on neural signalling in the hippocampus
<i>Period</i>	<i>Obligations</i>		
05/01/88-04/30/90	FY89: \$80,000	TOTAL: \$80,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Horowitz, J. M.	HQ-EB/Halstead, T. W.	51-Biological Sci	
Horwitz, B. A.			
NAS 1-18754	University of California - Davis	2017	Modeling and design analysis for composite primary aircraft structures
<i>Period</i>	<i>Obligations</i>		
01/04/89-01/03/92	FY89: \$143,000	TOTAL: \$143,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Rehfield, L. W.	LARC/Lopez, O. F.	49-Engr, NEC	
	LARC/Starnes, J. H.		
NAS 2-12334	University of California - Davis	2018	Thermoregulation in primates in the space environment
<i>Period</i>	<i>Obligations</i>		
10/01/85-09/30/88	FY89:	TOTAL: \$588,232	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Fuller, C.	ARC/Donnelly, N. J.	51-Biological Sci	
	ARC/Schatte, C. L.		
NAS 5-28754	University of California - Davis	2019	Application in LANDSAT images to analyze kinetics at the intersection of the Fault zones in California (integration of data and fields study)
<i>Period</i>	<i>Obligations</i>		
08/15/85-09/15/88	FY89:	TOTAL: \$193,404	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Finnerty, A. A.	GSFC/Oseroff, H.	32-Geological Sci	
Verosub, K.			
NAS 8-36550	University of California - Davis	2020	Airborne Doppler lidar measurements of the central California extended sea breeze
<i>Period</i>	<i>Obligations</i>		
09/20/85-01/31/88	FY89:	TOTAL: \$99,966	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Carroll, J. J.	MSFC/Fitzjarrald, D. E.	39-Env Sci, NEC	
	MSFC/Bilbro, J.		
NCA 2-153	University of California - Davis	2021	Vector borne disease modeling utilizing remote sensing and related ground data
<i>Period</i>	<i>Obligations</i>		
08/01/86-09/30/88	FY89:	TOTAL: \$14,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Washino, R.	ARC/Sebesta, P.	54-Env Biology	
	ARC/Lawless, J.		
NCA 2-172	University of California - Davis	2022	Convergence acceleration methods for application to the Navier-Stokes equations
<i>Period</i>	<i>Obligations</i>		
11/01/86-04/30/89	FY89:	TOTAL: \$67,105	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Cheer, A. Y.	ARC/Flores, J.	21-Mathematics	
Hafez, M. M.	ARC/Pulliam, T. H.		
NCA 2-210	University of California - Davis	2023	Numerical algorithms for steady and unsteady incompressible Navier-Stokes equations
<i>Period</i>	<i>Obligations</i>		
05/15/87-05/14/89	FY89:	TOTAL: \$57,400	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hafez, M. M.	ARC/Kwak, D.	46-Mech Engr	
NCA 2-229	University of California - Davis	2024	Measurement and modeling of the optical scattering properties of leaves and plant canopies
<i>Period</i>	<i>Obligations</i>		
06/15/87-06/14/89	FY89:	TOTAL: \$17,982	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Ustin, S. L.	ARC/Lawless, J. G.	54-Env Biology	

NASA'S UNIVERSITY PROGRAM **CALIFORNIA (Continued)**

NCA 2-383 University of California - Davis 2025
Convergence acceleration of hypersonic flow calculations
Period Obligations
02/01/89-01/31/91 FY89: \$33,296 TOTAL: \$33,296
Prin. Invest. NASA Tech. Officer CASE Category
Hafez, M. M. ARC/Green, M. 41-Aero Engr
Dwyer, H.

NCA 2-397 University of California - Davis 2026
Navier-Stokes calculations for innovative wing shapes
Period Obligations
04/01/89-10/31/90 FY89: \$71,458 TOTAL: \$71,458
Prin. Invest. NASA Tech. Officer CASE Category
Van Dam, C. P. ARC/Chang, I. C. 41-Aero Engr

NCA 2-410 University of California - Davis 2027
A velocity vorticity method for 3d viscous incompressible flow simulation
Period Obligations
05/15/89-05/14/91 FY89: \$30,084 TOTAL: \$30,084
Prin. Invest. NASA Tech. Officer CASE Category
Hafez, M. M. ARC/Kwak, D. 46-Mech Engr

NCA 2-428 University of California - Davis 2028
Validation of remote sensing based methods for predicting anopheles freeborni production in California rice fields
Period Obligations
08/01/89-09/30/90 FY89: \$22,000 TOTAL: \$22,000
Prin. Invest. NASA Tech. Officer CASE Category
Washino, R. K. ARC/Sebesta, P. D. 54-Env Biology

NCA 2-442 University of California - Davis 2029
Application of human resource management techniques to spaceflight and spaceflight analogous environments
Period Obligations
08/01/89-07/31/90 FY89: \$19,992 TOTAL: \$19,992
Prin. Invest. NASA Tech. Officer CASE Category
Harrison, A. ARC/Connors, M. M. 62-Social Aspects

NCA 2-450 University of California - Davis 2030
Calculations of three dimensional viscous flows with heat transfer
Period Obligations
10/01/89-09/30/90 FY89: \$25,000 TOTAL: \$25,000
Prin. Invest. NASA Tech. Officer CASE Category
Hafez, M. M. ARC/White, S. 46-Mech Engr

NCC 2-99 University of California - Davis 2031
Selection of crop varieties for efficient production using urea, ammonia, nitrite, and nitrate in the closed environmental life support system
Period Obligations
10/01/80-11/30/89 FY89: \$78,082 TOTAL: \$645,856
Prin. Invest. NASA Tech. Officer CASE Category
Huffaker, R. C. ARC/MacElroy, R. D. 55-Agriculture Sci
Rains, D. W.
Qualset, C. O.

NCC 2-186 University of California - Davis 2032
Reynolds-stress model for compressible flows
Period Obligations
04/01/82-04/30/90 FY89: \$51,076 TOTAL: \$256,988
Prin. Invest. NASA Tech. Officer CASE Category
Kollmann, W. ARC/Rubens, M. W. 41-Aero Engr
Minh, H. H. ARC/Viegas, J. R.
Vandromme, D.

NCC 2-252 University of California - Davis 2033
Numerical and experimental studies of particle flow in a high-pressure boundary layer wind tunnel
Period Obligations
06/15/83-06/14/89 FY89: \$2,214 TOTAL: \$40,021
Prin. Invest. NASA Tech. Officer CASE Category
White, B. R. ARC/Pollack, J. B. 32-Geological Sci
ARC/Smith, B. F.

NCC 2-392 University of California - Davis 2034
Analysis of nutrient element uptake by higher plants grown in sealed growth chambers
Period Obligations
02/01/86-06/30/89 FY89: TOTAL: \$167,937
Prin. Invest. NASA Tech. Officer CASE Category
Huffaker, R. C. ARC/MacElroy, R. D. 51-Biological Sci
Schwartzkopf, S.

NCC 2-469 University of California - Davis 2035
The human experience in antarctica application to life in space
Period Obligations
04/01/87-11/30/90 FY89: TOTAL: \$12,000
Prin. Invest. NASA Tech. Officer CASE Category
Harrison, A. A. ARC/McKay, C. P. 51-Biological Sci

NCC 2-567 University of California - Davis 2036
+gx effects on cardiopulmonary injury in rhesus monkeys related to cerv for space station
Period Obligations
09/01/88-10/31/89 FY89: \$75,673 TOTAL: \$75,673
Prin. Invest. NASA Tech. Officer CASE Category
Jones, J. H. ARC/Hargens, A. R. 51-Biological Sci
Tyler, W. S.
Fuller, C. A.

NCC 2-590 University of California - Davis 2037
Silicon carbide deoisutuib for ceramic composites
Period Obligations
01/01/89-12/31/89 FY89: \$34,137 TOTAL: \$34,137
Prin. Invest. NASA Tech. Officer CASE Category
Smith, J. M. ARC/Cagliostro, D. E. 43-Chem Engr

NCC 2-624 University of California - Davis 2038
Techniques for the design of high-bandwidth rotorcraft flight control systems
Period Obligations
07/01/89-06/30/90 FY89: \$58,978 TOTAL: \$58,978
Prin. Invest. NASA Tech. Officer CASE Category
Hess, R. A. ARC/Lebacqz, J. V. 41-Aero Engr
Gorder, P. ARC/Chen, R. T.

NGT 00-050-195 University of California - Davis 2039
NASA graduate student researchers program
Period Obligations
06/01/87-05/31/89 FY89: TOTAL: \$34,750
Prin. Invest. NASA Tech. Officer CASE Category
Fuller, C. A. HQ-XE/Owens, F. C. 51-Biological Sci

NGT 00-050-458 University of California - Davis 2040
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Fuller, C. A. HQ-XE/Owens, F. C. 51-Biological Sci

NASA'S UNIVERSITY PROGRAM **CALIFORNIA (Continued)**

NGT 00-070-018 University of California - Davis 2041
Graduate student researchers underrepresented minority focus program
Period Obligations
06/01/87-05/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Coss, R. G. HQ-XE/Owens, F. C. 69-Psych, NEC

NAG 1-668 University of California - Irvine 2042
A large scale empirical study of error detection using self test
Period Obligations
04/01/86-03/31/90 FY89: \$120,000 TOTAL: \$304,813
Prin. Invest. NASA Tech. Officer CASE Category
Leveson, N. G. LARC/Eckhardt, D. E., Jr. 22-Computer Science

NAG 1-783 University of California - Irvine 2043
Trace gas analysis from the DC 8 aircraft
Period Obligations
06/15/87-09/30/90 FY89: \$294,417 TOTAL: \$545,354
Prin. Invest. NASA Tech. Officer CASE Category
Rowland, F. S. LARC/Hoell, J. M. 31-Atmos Sci
LARC/Drewry, J. W.

NAG 2-399 University of California - Irvine 2044
Physiology of developing gravity receptors and otolith ocular reflexes in rats
Period Obligations
04/01/86-12/31/89 FY89: \$42,000 TOTAL: \$198,600
Prin. Invest. NASA Tech. Officer CASE Category
Blanks, R. H. ARC/Ross, M. D. 51-Biological Sci
ARC/Holton, E.

NAG 2-555 University of California - Irvine 2045
Effects of zero gravity exposure on the oxidative capacity of skeletal muscle fiber types
Period Obligations
10/01/88-10/31/89 FY89: \$118,114 TOTAL: \$118,114
Prin. Invest. NASA Tech. Officer CASE Category
Baldwin, K. M. ARC/Leon, H. A. 51-Biological Sci
ARC/Winget, C. M.

NAG 3-627 University of California - Irvine 2046
Ignition and flame speed above liquid fuel pools gravity effects
Period Obligations
03/01/85-07/30/90 FY89: \$45,000 TOTAL: \$327,757
Prin. Invest. NASA Tech. Officer CASE Category
Sirignano, W. A. LERC/Ross, H. D. 49-Engr, NEC
LERC/Sackstedgr, R.

NAG 3-1042 University of California - Irvine 2047
In situ measurements in support of nitrogen oxides
Period Obligations
04/25/89-04/24/90 FY89: \$83,825 TOTAL: \$83,825
Prin. Invest. NASA Tech. Officer CASE Category
Samuelson, G. S. LERC/Tacina, R. R. 41-Aero Engr
Sowa, W. A.

NAGW 93 University of California - Irvine 2048
Research in solar plasma theory
Period Obligations
06/01/80-09/30/89 FY89: \$169,396 TOTAL: \$1,319,451
Prin. Invest. NASA Tech. Officer CASE Category
Hoven, G. V. HQ-ES/Curtis, S. A. 13-Physics
Steinolfson, R. S. HQ-ES/Mellott, M. M.

NAGW 212 University of California - Irvine 2049
Models of energy transformation during the early evolution of life
Period Obligations
06/01/81-11/30/89 FY89: \$82,001 TOTAL: \$661,897
Prin. Invest. NASA Tech. Officer CASE Category
Lanyi, T. K. HQ-EB/Rummel, J. D. 51-Biological Sci
Goldman, M. V. HQ-EB/Averner, M.

NAGW 452 University of California - Irvine 2050
Latitudinal gradients in tropospheric concentrations of selected halocarbons and hydrocarbons
Period Obligations
03/15/83-03/14/90 FY89: \$164,917 TOTAL: \$1,030,453
Prin. Invest. NASA Tech. Officer CASE Category
Rowland, F. S. HQ-EE/Kurylo, M. J. 31-Atmos Sci
HQ-EE/Watson, R. T.

NAS 2-10522 University of California - Irvine 2051
Life science experiment ARC 781-127, effect of zero-gravity on biochemical and metabolic properties of skeletal muscle
Period Obligations
01/15/80-09/30/88 FY89: TOTAL: \$394,030
Prin. Invest. NASA Tech. Officer CASE Category
Baldwin, K. M. ARC/Ballard, R. W. 51-Biological Sci
ARC/Leon, H. A.

NAS 2-12834 University of California - Irvine 2052
Enhancement of in space operations using spatial perception auditory referencing
Period Obligations
05/23/88-05/22/90 FY89: TOTAL: \$135,220
Prin. Invest. NASA Tech. Officer CASE Category
Blanks, R. ARC/Wentzel, B. 41-Aero Engr

NAS 9-17767 University of California - Irvine 2053
Developing and conducting life sciences experiment e080 isometric exercise performance under zero G conditions
Period Obligations
04/22/87-01/01/92 FY89: \$14,882 TOTAL: \$446,882
Prin. Invest. NASA Tech. Officer CASE Category
Petrofsky, J. S. JSC/Seitz, W. W. 59-Life Sci, NEC

NCA 2-353 University of California - Irvine 2054
Computational volumetric radiative transfer for ATOV's
Period Obligations
09/01/88-08/31/89 FY89: TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
Edwards, D. K. ARC/Davy, W. C. 46-Mech Engr

NCA 2-391 University of California - Irvine 2055
The spatial and velocity structure of the shock waves in OMC
Period Obligations
03/01/89-09/30/89 FY89: \$29,849 TOTAL: \$29,849
Prin. Invest. NASA Tech. Officer CASE Category
Garden, R. P. ARC/Hollenbach, D. 13-Physics

NGT 00-050-372 University of California - Irvine 2056
NASA graduate student researchers program
Period Obligations
08/01/88-07/31/89 FY89: TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Sirignano, W. A. HQ-XE/Owens, F. C. 46-Mech Engr

NASA'S UNIVERSITY PROGRAM CALIFORNIA (Continued)

NSG 7375 University of California - Irvine 2057
Coronal plasma structures
Period *Obligations*
06/01/77-10/31/89 FY89: \$85,000 TOTAL: \$708,653
Prin. Invest. NASA Tech. Officer CASE Category
Van Hoven, G. HQ-EZ/Ahluwalia, H. S. 13-Physics
HQ-ES/Kane, S.

NAG 1-270 University of California - Los Angeles 2058
Numerical methods for compressible flow calculations
Period *Obligations*
05/15/82-02/28/90 FY89: \$54,217 TOTAL: \$313,401
Prin. Invest. NASA Tech. Officer CASE Category
Osher, S. J. LARC/MacAraeg, M. G. 41-Aero Engr
LARC/Kumar, A.

NAG 1-464 University of California - Los Angeles 2059
Control laws for distributed parameter systems
Period *Obligations*
03/15/84-09/14/88 FY89: TOTAL: \$155,582
Prin. Invest. NASA Tech. Officer CASE Category
Balakrishnan, A. V. LARC/Joshi, S. M. 45-Elec Engr
LARC/Taylor Jr., L. W.

NAG 1-833 University of California - Los Angeles 2060
Optimal structural design and composite helicopter rotor blades with straight and swept tips
Period *Obligations*
11/16/87-11/15/89 FY89: \$61,148 TOTAL: \$117,720
Prin. Invest. NASA Tech. Officer CASE Category
Friedmann, P. P. LARC/Adelman, H. M. 41-Aero Engr
LARC/Pritchard, J. I.

NAG 2-303 University of California - Los Angeles 2061
Survey and analysis of x band radar for flight research in the western aeronautical test range
Period *Obligations*
07/01/84-06/30/89 FY89: TOTAL: \$223,663
Prin. Invest. NASA Tech. Officer CASE Category
Yao, K. ARC/Anderson, K. F. 29-Math/Computer, NEC
Balakrishnan, A. V. ARC/Moore, A. L.

NAG 2-313 University of California - Los Angeles 2062
SIRTF pre-definition phase analyses
Period *Obligations*
07/01/84-10/31/89 FY89: \$25,000 TOTAL: \$114,019
Prin. Invest. NASA Tech. Officer CASE Category
Jura, M. A. ARC/Ramos, R. 11-Astronomy
ARC/Hing, S. M.

NAG 2-315 University of California - Los Angeles 2063
A SIRTF interdisciplinary scientist proposal for pre-definition phase
Period *Obligations*
07/01/84-08/31/90 FY89: \$60,000 TOTAL: \$178,069
Prin. Invest. NASA Tech. Officer CASE Category
Wright, E. L. ARC/Ramos, R. 11-Astronomy
ARC/Leidich, C. A.

NAG 2-441 University of California - Los Angeles 2064
Ubsystem models
Period *Obligations*
07/01/87-06/30/90 FY89: TOTAL: \$64,500
Prin. Invest. NASA Tech. Officer CASE Category
Levan, N. ARC/Duke, E. L. 41-Aero Engr
Balakrishnan, A. V. ARC/Illiff, K. W.

NAG 2-450 University of California - Los Angeles 2065
Validation of muscle volume determinations by magnetic resonance imaging
Period *Obligations*
04/01/87-09/30/89 FY89: \$64,047 TOTAL: \$247,697
Prin. Invest. NASA Tech. Officer CASE Category
Edgerton, V. R. ARC/Grindeland, R. E. 56-Medical Sciences
Martin, T. P.
Hodgson, J. A.

NAG 2-477 University of California - Los Angeles 2066
Aeromechanical problems with active controls
Period *Obligations*
08/01/87-03/31/90 FY89: TOTAL: \$123,752
Prin. Invest. NASA Tech. Officer CASE Category
Friedmann, P. ARC/Jacklin, S. A. 41-Aero Engr

NAG 2-485 University of California - Los Angeles 2067
Data analysis for the Pioneer Venus electric field detector
Period *Obligations*
10/01/87-01/31/90 FY89: \$130,001 TOTAL: \$247,001
Prin. Invest. NASA Tech. Officer CASE Category
Strangeway, R. J. ARC/Fimmel, R. O. 11-Astronomy
ARC/Craig, R. A.

NAG 2-501 University of California - Los Angeles 2068
Analysis of magnetic field data from the Pioneer Venus orbiter
Period *Obligations*
10/01/87-10/31/89 FY89: \$395,000 TOTAL: \$795,000
Prin. Invest. NASA Tech. Officer CASE Category
Russell, C. ARC/Lasher, L. E. 11-Astronomy
ARC/Craig, R. A.

NAG 2-516 University of California - Los Angeles 2069
Mechano caloric cooling device
Period *Obligations*
05/15/88-11/30/89 FY89: TOTAL: \$25,000
Prin. Invest. NASA Tech. Officer CASE Category
Frederking, T. H. ARC/Lee, J. M. 13-Physics
ARC/Kittel, P.

NAG 3-451 University of California - Los Angeles 2070
Thin film temperature sensor
Period *Obligations*
08/01/83-11/01/89 FY89: \$75,000 TOTAL: \$542,038
Prin. Invest. NASA Tech. Officer CASE Category
Bunshah, R. F. LERC/Holanda, R. 47-Materials Engr
LERC/Englund, D. R.

NAG 3-899 University of California - Los Angeles 2071
Dynamic behavior of heat pipes
Period *Obligations*
04/20/88-10/15/89 FY89: \$46,403 TOTAL: \$66,403
Prin. Invest. NASA Tech. Officer CASE Category
Catton, I. LERC/Baker, K. W. 46-Mech Engr
LERC/Juhasz, A. J.

NAG 5-152 University of California - Los Angeles 2072
Thermal isotacy in the world's oceans
Period *Obligations*
04/01/81-04/30/90 FY89: \$98,634 TOTAL: \$478,585
Prin. Invest. NASA Tech. Officer CASE Category
Schubert, G. GSFC/Welker, J. 32-Geological Sci

NASA'S UNIVERSITY PROGRAM CALIFORNIA (Continued)

NAG 5-447 University of California - Los Angeles 2073
Tectonic deformation in California
Period *Obligations*
07/15/84-04/30/90 FY89: \$72,717 TOTAL: \$342,593
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Jackson, D. D. GSFC/Frey, H. V. 32-Geological Sci

NAG 5-488 University of California - Los Angeles 2074
A theoretical investigation of auroral dynamics
Period *Obligations*
03/01/85-02/28/90 FY89: \$45,000 TOTAL: \$392,847
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Maggs, J. E. GSFC/Bullock, G. D. 19-Phys Sci, NEC
GSFC/Hoffman, R. A.

NAG 5-536 University of California - Los Angeles 2075
Magnetospheric studies using the United Kingdom satellite data
Period *Obligations*
05/15/85-08/14/88 FY89: TOTAL: \$109,935
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Russell, C. T. GSFC/Curtis, S. A. 13-Physics
Walker, R. J. GSFC/Ousley, G. W.
Kivelson, M. G.

NAG 5-575 University of California - Los Angeles 2076
Coordinated ultraviolet optical infrared observations of quasars
Period *Obligations*
07/01/85-12/31/89 FY89: \$15,000 TOTAL: \$192,100
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Malkan, M. A. GSFC/Kondo, Y. 11-Astronomy
Sun, W. H.

NAG 5-713 University of California - Los Angeles 2077
Estimation theory satellite data assimilation and atmospheric predictability
Period *Obligations*
09/15/85-04/14/90 FY89: \$142,000 TOTAL: \$583,999
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Ghil, M. GSFC/Pfaendtner, J. 31-Atmos Sci

NAG 5-789 University of California - Los Angeles 2078
Numerical modeling of the global atmosphere
Period *Obligations*
06/01/86-11/30/89 FY89: \$77,890 TOTAL: \$373,890
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Arakawa, A. GSFC/Suarez, M. 31-Atmos Sci

NAG 5-863 University of California - Los Angeles 2079
Data analysis of the charged composition Explorer plasma wave experiment
Period *Obligations*
11/15/86-04/14/90 FY89: \$64,000 TOTAL: \$183,598
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Strongway, R. J. GSFC/Curtis, S. A. 13-Physics
GSFC/Acuna, M. H.

NAG 5-1040 University of California - Los Angeles 2080
Satellite gradiometer studies and three dimensional modeling of small scale convection beneath the oceanic lithosphere
Period *Obligations*
03/15/88-04/30/90 FY89: \$105,488 TOTAL: \$205,488
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Kaula, W. GSFC/Welker, J. E. 32-Geological Sci

NAG 5-1063 University of California - Los Angeles 2081
Temperatures of planetary nebulae nuclei
Period *Obligations*
08/01/88-07/31/90 FY89: TOTAL: \$20,800
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Aller, L. GSFC/Kondo, Y. 11-Astronomy

NAG 5-1067 University of California - Los Angeles 2082
Analysis of the ISEE magnetometer experiment data
Period *Obligations*
08/01/88-10/31/89 FY89: \$267,200 TOTAL: \$395,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Russell, C. T. GSFC/Wales, R. O. 19-Phys Sci, NEC

NAG 5-1085 University of California - Los Angeles 2083
Search for a close companion to a selected rotating carbon star
Period *Obligations*
10/01/88-09/30/89 FY89: \$3,000 TOTAL: \$6,500
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Jura, M. GSFC/Kondo, Y. 11-Astronomy

NAG 5-1100 University of California - Los Angeles 2084
Theoretical technology research for ISTP mission
Period *Obligations*
11/01/88-10/31/89 FY89: \$115,000 TOTAL: \$115,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Abdalla, M. A. GSFC/Curtis, S. A. 13-Physics
GSFC/Acuna, M. H.

NAG 5-1166 University of California - Los Angeles 2085
Calibration of magnetically induced solar velocity signals for the golf investigation
Period *Obligations*
07/15/89-01/14/90 FY89: \$60,000 TOTAL: \$60,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Ulrich, R. K. GSFC/Poland, A. I. 11-Astronomy

NAG 5-1167 University of California - Los Angeles 2086
Participation in cluster magnetometer consortium for the cluster mission
Period *Obligations*
07/15/89-07/14/90 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Kivelson, M. G. GSFC/Acuna, M. 13-Physics

NAG 5-1207 University of California - Los Angeles 2087
Chemical compositions of planetary nebulae with space reference to carbon nitrogen and oxygen
Period *Obligations*
08/01/89-07/31/90 FY89: \$31,000 TOTAL: \$31,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Aller, L. H. GSFC/West, D. 11-Astronomy

NAG 5-1208 University of California - Los Angeles 2088
The spatial extent of infrared emission around pre and post main-sequence stars
Period *Obligations*
08/01/89-07/31/90 FY89: \$25,000 TOTAL: \$25,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Zuckerman, B. M. GSFC/West, D. 11-Astronomy

NASA'S UNIVERSITY PROGRAM **CALIFORNIA (Continued)**

NAG 8-74 University of California - Los Angeles 2089
Analytic and simulation studies of the acceleration of heavy ions
Period *Obligations*
08/26/86-06/19/89 FY89: TOTAL: \$121,922
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Abdella, M. A. MSFC/Chappell, C. R. 31-Atmos Sci
Kropoff, L. MSFC/Fields, S. A.

NAG 9-27 University of California - Los Angeles 2090
Isotopic analysis of light elements in extraterrestrial materials
Period *Obligations*
02/01/83-12/01/89 FY89: \$50,001 TOTAL: \$364,012
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Kerridge, J. F. JSC/Browne, I. D. 12-Chemistry
Kaplan, I. R.

NAG 9-40 University of California - Los Angeles 2091
Geochemical studies of lunar materials
Period *Obligations*
02/01/83-02/01/90 FY89: \$156,000 TOTAL: \$1,041,400
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wasson, J. T. JSC/Browne, I. D. 32-Geological Sci
Grossman, J. M.
Rubin, A. E.

NAG 9-87 University of California - Los Angeles 2092
Pristine lunar rocks and the genesis of early planetary crusts
Period *Obligations*
05/01/85-02/01/90 FY89: \$102,000 TOTAL: \$527,500
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Warren, P. H. JSC/Browne, I. D. 19-Phys Sci, NEC
Kallermeyn, G. W.

NAG 9-96 University of California - Los Angeles 2093
Primordial planetary differentiation and its after effects
Period *Obligations*
03/01/85-03/01/90 FY89: \$25,000 TOTAL: \$130,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wasson, J. T. JSC/Browne, I. D. 32-Geological Sci
Warren, P. H.

NAG 9-179 University of California - Los Angeles 2094
Preflight postflight measurement of dynamic ocular counterrolling
Period *Obligations*
09/01/86-03/01/90 FY89: \$29,850 TOTAL: \$110,925
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Markham, C. H. JSC/Kutyna, F. A. 56-Medical Sciences

NAG 9-323 University of California - Los Angeles 2095
Molecular basis of tension development in muscular atrophy
Period *Obligations*
12/01/88-12/01/89 FY89: \$79,600 TOTAL: \$79,600
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Kasper, C. E. JSC/Sams, C. F. 51-Biological Sci

NAGW 78 University of California - Los Angeles 2096
Space plasma physics theory and simulation
Period *Obligations*
07/01/80-09/30/89 FY89: \$210,048 TOTAL: \$2,151,081
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Abdulla, M. A. HQ-ES/Mellott, M. M. 39-Env Sci, NEC
GSFC/Curtis, S. A.

NAGW 80 University of California - Los Angeles 2097
Theoretical studies of extragalactic grains
Period *Obligations*
10/01/80-09/30/89 FY89: \$36,200 TOTAL: \$284,223
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Jura, M. A. HQ-EZ/Gillett, F. C. 11-Astronomy
HQ-EZ/Boggess, N. W.

NAGW 87 University of California - Los Angeles 2098
Theoretical studies of the plasma environments of Jupiter and Saturn, their magnetospheres and their satellites
Period *Obligations*
07/01/80-11/30/89 FY89: \$48,200 TOTAL: \$455,383
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Siscoe, G. L. HQ-EL/Bergstrahl, J. T. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NAGW 104 University of California - Los Angeles 2099
High-pressure cosmochemistry applied to major planetary interiors: Experimental studies
Period *Obligations*
11/01/80-10/31/89 FY89: \$16,700 TOTAL: \$448,251
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Nicol, M. F. HQ-EL/Underwood, J. R. 11-Astronomy
HQ-EL/Boyce, J. M.

NAGW 347 University of California - Los Angeles 2100
Isotopic characteristics of prebinitic synthesis of organic matter
Period *Obligations*
07/01/82-12/31/89 FY89: \$72,499 TOTAL: \$395,965
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Kerridge, J. F. HQ-EB/Rummel, J. D. 12-Chemistry
HQ-EB/Souner, M.

NAGW 472 University of California - Los Angeles 2101
Theoretical studies in lyport of a solar seismology mission
Period *Obligations*
06/01/83-10/31/89 FY89: \$164,000 TOTAL: \$728,168
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Ulrich, R. HQ-ES/Bohlin, J. D. 13-Physics
HQ-EZ/Spicer, D. S.

NAGW 717 University of California - Los Angeles 2102
Investigation of interplanetary flux enhancement 3 and their possible association with outgassing small bodies in the inner solar system
Period *Obligations*
04/01/85-10/31/89 FY89: \$40,001 TOTAL: \$287,001
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Russell, C. T. HQ-EB/Bergstrahl, J. T. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NAGW 825 University of California - Los Angeles 2103
Paleobiology of the proterozoic
Period *Obligations*
12/15/85-12/14/89 FY89: \$32,920 TOTAL: \$236,240
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Schopf, J. W. HQ-EB/Rummel, J. D. 32-Geological Sci
Hayes, J. M. HQ-EB/Averner, M.
Gest, H.

NAGW 968 University of California - Los Angeles 2104
Phobos CO investigator support
Period *Obligations*
08/01/86-01/31/90 FY89: TOTAL: \$95,993
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Kennel, C. F. HQ-EL/Brinton, H. C. 31-Atmos Sci
HQ-EL/Quaide, W. L.

**NASA'S UNIVERSITY PROGRAM
CALIFORNIA (Continued)**

NAGW 995 University of California - Los Angeles 2105
Theoretical studies and supporting research in magnetospheric physics
Period *Obligations*
11/01/86-07/31/89 FY89: TOTAL: \$323,390
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Sarf, F. L. HQ-EE/Theis, R. F. 13-Physics
HQ-EE/Eastman, T. E.

NAGW 1021 University of California - Los Angeles 2106
General circulation of the Southern Hemisphere stratosphere
Period *Obligations*
05/01/87-12/31/89 FY89: \$80,000 TOTAL: \$173,703
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Mecho, C. R. HQ-EE/McPeters, R. D. 31-Atmos Sci
HQ-EE/Prather, M. J.

NAGW 1044 University of California - Los Angeles 2107
Global meteorological research with scatterometer wind data
Period *Obligations*
04/15/87-10/14/88 FY89: TOTAL: \$69,960
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wurtele, M. G. HQ-EE/Curran, R. J. 31-Atmos Sci
HQ-EE/Theon, J. S.

NAGW 1065 University of California - Los Angeles 2108
A search for subsurface ice on Mars using Viking thermal mapper data
Period *Obligations*
04/15/87-09/30/89 FY89: \$25,140 TOTAL: \$55,704
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Paige, D. A. HQ-EL/Underwood, J. R. 32-Geological Sci
HQ-EL/Boyce, J. M.

NAGW 1179 University of California - Los Angeles 2109
A magnetotail model of Uranus and an investigation of spacecraft charging
Period *Obligations*
10/01/87-09/30/90 FY89: \$80,000 TOTAL: \$120,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Walker, R. J. HQ-EL/Quaide, W. L. 19-Phys Sci, NEC
HQ-EE/Parks, G.

NAGW 1189 University of California - Los Angeles 2110
Analysis of plasma data from the Uranus encounter
Period *Obligations*
09/15/87-09/14/89 FY89: \$52,709 TOTAL: \$154,166
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Siscoe, G. L. HQ-EL/Quaide, W. L. 19-Phys Sci, NEC
HQ-EE/Parks, G.

NAGW 1190 University of California - Los Angeles 2111
The interaction of the solar wind with Uranus
Period *Obligations*
10/01/87-09/30/90 FY89: \$60,000 TOTAL: \$100,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Russell, C. T. HQ-EL/Quaide, W. L. 19-Phys Sci, NEC
HQ-EL/Slavin, J. A.

NAGW 1220 University of California - Los Angeles 2112
Emission cone modeling of uranian kilometric radiation
Period *Obligations*
09/01/87-08/31/90 FY89: \$80,000 TOTAL: \$120,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Barbosa, D. D. HQ-EL/Quaide, W. L. 19-Phys Sci, NEC
HQ-EL/Slavin, J. A.

NAGW 1227 University of California - Los Angeles 2113
A kinetic study of solar wind coma interaction
Period *Obligations*
10/01/87-09/30/89 FY89: \$22,878 TOTAL: \$61,366
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Omid, N. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Perry, T.

NAGW 1347 University of California - Los Angeles 2114
Aeronomical peculiarities of the unmagnetized planets related to the solar wind interaction: Inferences for Mars from Venus
Period *Obligations*
06/01/88-11/30/89 FY89: \$34,136 TOTAL: \$92,467
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Luhmann, J. G. HQ-EL/Bergstrahl, J. T. 13-Physics
HQ-EL/Quaide, W. L.

NAGW 1379 University of California - Los Angeles 2115
Participation in the Phobos mission studies of the Mars solar wind interaction
Period *Obligations*
07/01/88-12/31/89 FY89: TOTAL: \$20,900
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Luhmann, J. G. HQ-EL/Brinton, H. C. 13-Physics

NAGW 1558 University of California - Los Angeles 2116
Plasma physics of planetary magnetospheres
Period *Obligations*
01/01/89-12/31/89 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Barbosa, D. D. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Perry, T. W.

NAGW 1624 University of California - Los Angeles 2117
Space plasma physics at UCLA
Period *Obligations*
03/01/89-02/28/90 FY89: \$107,000 TOTAL: \$107,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Kennel, C. F. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Perry, T. W.

NAGW 1633 University of California - Los Angeles 2118
Magnetospheric studies using the AMPTE UKS data
Period *Obligations*
03/01/89-02/28/90 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Elphic, R. C. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Perry, T. W.

NAGW 1635 University of California - Los Angeles 2119
Electron dynamics in the auroral plasma
Period *Obligations*
01/01/89-12/31/89 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Maggs, J. E. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Perry, T. W.

NAGW 1639 University of California - Los Angeles 2120
Jovian auroral processes
Period *Obligations*
03/01/89-02/28/90 FY89: \$60,600 TOTAL: \$60,600
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Thorne, R. M. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Perry, T. W.

NASA'S UNIVERSITY PROGRAM CALIFORNIA (Continued)

NAGW 1649 University of California - Los Angeles 2121
The dynamics of the magnetopause and shock waves in dissipative MHD and kinetic theory

Period	Obligations	
01/01/89-12/31/89	FY89: \$60,000	TOTAL: \$60,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Dawson, J. M.	HQ-ES/Mellott, M. M.	13-Physics
	HQ-ES/Perry, T. W.	

NAGW 1753 University of California - Los Angeles 2122
The magnetic field data from the Phobos mission to Mars

Period	Obligations	
02/01/89-01/31/90	FY89: \$50,000	TOTAL: \$50,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Russell, C. T.	HQ-EL/Quaide, W.	13-Physics

NAG10-52 University of California - Los Angeles 2123
Porous membrane biomass growth systems for CELSS which confines and supplies nutrient solution on demand

Period	Obligations	
10/01/88-09/30/89	FY89:	TOTAL: \$67,278
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Berry, W. L.	KSC/Knott, W. M.	55-Agriculture Sci

NAS 2-12383 University of California - Los Angeles 2124
Analysis of Pioneer Venus orbiter magnetic field data

Period	Obligations	
10/01/85-09/30/87	FY89:	TOTAL: \$859,037
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Russell, C. T.	ARC/Craig, R. A.	11-Astronomy
	ARC/Fimmell, R. O.	

NAS 5-26846 University of California - Los Angeles 2125
Magnetic field investigation for the polar plasma laboratory of the origin of plasmas in the Earth's neighborhood mission

Period	Obligations	
06/11/82-07/31/89	FY89: \$179,636	TOTAL: \$698,561
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Russell, C. T.	GSFC/Weinscott, F. H.	19-Phys Sci, NEC

NAS 5-26852 University of California - Los Angeles 2126
A magnetic field investigation for the equatorial magnetospheric laboratory

Period	Obligations	
06/11/82-12/31/89	FY89:	TOTAL: \$124,792
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
McPherron, R. L.	GSFC/O'Brien, J. J.	13-Physics

NAS 5-26871 University of California - Los Angeles 2127
Development of theoretical technology for origin of plasmas in the Earth's neighborhood (OPEN)

Period	Obligations	
05/03/82-06/30/88	FY89:	TOTAL: \$81,722
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Ashour-abdalla G. M.	GSFC/O'Brien, J. J.	13-Physics

NAS 5-27670 University of California - Los Angeles 2128
Data analysis studies and algorithm development for the COBE satellite

Period	Obligations	
06/28/83-05/30/91	FY89: \$90,000	TOTAL: \$425,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Wright, E. L.	GSFC/Mather, J. C.	11-Astronomy

NAS 5-28448 University of California - Los Angeles 2129
Data reduction and analysis for the ISEE 1 and 2 spacecraft's magnetometer experiment

Period	Obligations	
10/01/84-09/30/88	FY89:	TOTAL: \$1,601,361
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Russell, C. T.	GSFC/Wales, R. O.	31-Atmos Sci

NAS 5-29363 University of California - Los Angeles 2130
High resolution spectrograph guaranteed time observations

Period	Obligations	
12/12/86-09/30/91	FY89:	TOTAL: \$64,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Jura, M.	GSFC/Vitagliano, H. D.	11-Astronomy

NAS 5-30373 University of California - Los Angeles 2131
Magnetic field investigation for polar spacecraft

Period	Obligations	
04/12/89-01/31/94	FY89: \$400,000	TOTAL: \$400,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Russell, C. T.	GSFC/Crosby, D.	11-Astronomy

NAS 8-37750 University of California - Los Angeles 2132
Risk-based fire safety definitions

Period	Obligations	
08/29/88-08/30/89	FY89:	TOTAL: \$105,674
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Apostolakis, G. E.	MSFC/Austin, J. G.	42-Astro Engr

NCA 2-180 University of California - Los Angeles 2133
Axisymmetric model for the Orion nebula

Period	Obligations	
11/01/86-10/31/88	FY89:	TOTAL: \$79,999
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Zuckerman, B.	ARC/Erickson, E.	11-Astronomy

NCA 2-246 University of California - Los Angeles 2134
Jovian atmospheric structure

Period	Obligations	
09/01/87-06/30/89	FY89:	TOTAL: \$12,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Schubert, G.	ARC/Young, R. E.	11-Astronomy

NCA 2-268 University of California - Los Angeles 2135
Recording of muscle forces and electromyographic signals in vivo from rat hindlimb muscles

Period	Obligations	
09/01/87-11/30/88	FY89:	TOTAL: \$22,300
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Roy, R. R.	ARC/Grindeland, R. E.	51-Biological Sci
Edgerton, V. R.		

NCA 2-305 University of California - Los Angeles 2136
Ozone hole analysis and simulation

Period	Obligations	
04/15/88-12/31/89	FY89:	TOTAL: \$23,800
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Turco, R.	ARC/Toon, O. B.	12-Chemistry

**NASA'S UNIVERSITY PROGRAM
CALIFORNIA (Continued)**

NCA 2-352 University of California - Los Angeles 2137
Microbial mats interaction between the carbon and sulfur cycles and the preservation of biological features

Period	Obligations	
10/01/88-04/30/90	FY89: \$5,000	TOTAL: \$5,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Farmer, J.	ARC/Des Marais, D. J.	39-Env Sci, NEC

NCA 2-372 University of California - Los Angeles 2138
Local nonlinear filters and nonreflecting far field boundary conditions for conservation laws

Period	Obligations	
12/01/88-11/30/89	FY89: \$24,000	TOTAL: \$24,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Engquist, B.	ARC/Warming, R. ARC/Beam, R.	21-Mathematics

NCA 2-373 University of California - Los Angeles 2139
Silicon line emission in gaseous nebulae

Period	Obligations	
11/17/88-11/16/89	FY89: \$39,999	TOTAL: \$39,999
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Zuckerman, B.	ARC/Erickson, E. F.	11-Astronomy

NCA 2-377 University of California - Los Angeles 2140
Stratospheric chemistry modeling

Period	Obligations	
01/01/89-12/31/90	FY89: \$33,000	TOTAL: \$33,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Turco, R. P. Elliott, S.	ARC/Toon, O. B.	31-Atmos Sci

NCA 2-394 University of California - Los Angeles 2141
Far infrared spectroscopy of the galactic center ARC

Period	Obligations	
03/15/89-09/30/90	FY89: \$9,500	TOTAL: \$9,500
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Morris, M.	ARC/Erickson, E. F.	11-Astronomy

NCA 2-400 University of California - Los Angeles 2142
Modeling the history of the Titan atmosphere

Period	Obligations	
04/01/89-03/31/90	FY89: \$7,000	TOTAL: \$7,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Quest, K. B.	ARC/Pollack, J. B. ARC/McKay, C. P.	11-Astronomy

NCA 2-390502 University of California - Los Angeles 2143
Etiology of tissue changes in rat muscle in response to hind limb suspension

Period	Obligations	
10/01/84-09/30/87	FY89:	TOTAL: \$65,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Edgerton, V. R. Roy, R. R. Vailas, A. C.	ARC/Grindeland, R. E.	51-Biological Sci

NCC 2-374 University of California - Los Angeles 2144
Laboratory for flight-systems research

Period	Obligations	
07/01/85-10/31/89	FY89: \$516,565	TOTAL: \$1,084,816
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Balakrishnan, A. V.	ARC/Illiff, K. W.	49-Engr, NEC

NCC 2-535 University of California - Los Angeles 2145
Muscle feasibility for rhesus

Period	Obligations	
05/01/88-10/31/89	FY89: \$105,784	TOTAL: \$150,784
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Edgerton, V. R. Roy, R. R. Hodgson, J. H.	ARC/Ballard, R. W. ARC/Winget, C. M.	51-Biological Sci

NCC 2-584 University of California - Los Angeles 2146
Augmented research program in flow surface and jet plate interactions

Period	Obligations	
01/01/89-12/31/89	FY89: \$20,000	TOTAL: \$20,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Meecham, W. C.	ARC/Soderman, P. T. ARC/Corsiglia, V. R.	41-Aero Engr

NGL 05-007-002 University of California - Los Angeles 2147
Theoretical evaluation of the internal structures and atmospheres of planets and the Moon

Period	Obligations	
01/01/62-10/31/89	FY89: \$33,300	TOTAL: \$1,305,025
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Kaula, W. M.	HQ-EL/Underwood, J. HQ-EL/Boyce, J. M.	32-Geological Sci

NGL 05-007-004 University of California - Los Angeles 2148
Theoretical and experimental investigations of particles and fields in space, including construction of prototype instrumentation

Period	Obligations	
03/01/62-09/30/89	FY89: \$170,000	TOTAL: \$5,147,304
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Coleman, P. J. Woods, N.	HQ-ES/Mellott, M. M. HQ-ES/Perry, T. W.	39-Env Sci, NEC

NGR 05-007-407 University of California - Los Angeles 2149
Paleobiologic studies of the antiquity and Precambrian evolution of life

Period	Obligations	
04/10/73-12/31/89	FY89: \$65,000	TOTAL: \$754,680
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Schopf, J. W.	HQ-EB/Rummel, J. D. HQ-EB/Averner, M.	32-Geological Sci

NGT 00-050-228 University of California - Los Angeles 2150
NASA graduate student researchers program

Period	Obligations	
07/01/89-06/30/90	FY89: \$18,000	TOTAL: \$54,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Bird, G. P.	HQ-XE/Owens, F. C.	32-Geological Sci

NGT 00-050-247 University of California - Los Angeles 2151
NASA graduate student researchers program

Period	Obligations	
09/01/87-08/31/89	FY89:	TOTAL: \$35,967
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Stenzel, R. L.	HQ-XE/Owens, F. C.	13-Physics

NGT 00-050-444 University of California - Los Angeles 2152
NASA graduate student researchers program

Period	Obligations	
07/01/89-06/30/90	FY89: \$18,000	TOTAL: \$18,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Friedmann, P. P.	HQ-XE/Owens, F. C.	41-Aero Engr

NASA'S UNIVERSITY PROGRAM **CALIFORNIA (Continued)**

NGT 00-070-025 University of California - Los Angeles 2153
 Graduate student researchers underrepresented minority focus program

<i>Period</i>	<i>Obligations</i>	
07/01/87-06/30/89	FY89: TOTAL: \$20,500	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Grindeland, R.	HQ-XE/Owens, F. C.	19-Phys Sci, NEC

NSG 5272 University of California - Los Angeles 2161
 Problems of mass loss and mass transfer in close binary systems

<i>Period</i>	<i>Obligations</i>	
05/01/78-07/31/90	FY89: \$25,000 TOTAL: \$271,566	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Plavec, M. J.	GSFC/West, D.	11-Astronomy
Keyes, C. D.		

NGT 00-070-039 University of California - Los Angeles 2154
 Graduate student researchers underrepresented minority focus program

<i>Period</i>	<i>Obligations</i>	
07/01/87-06/30/90	FY89: \$18,000 TOTAL: \$54,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Malkan, M.	HQ-XE/Owens, F. C.	11-Astronomy

NSG 7164 University of California - Los Angeles 2162
 Dynamical studies of the Venus atmosphere

<i>Period</i>	<i>Obligations</i>	
09/01/75-10/31/89	FY89: \$46,000 TOTAL: \$474,806	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Schubert, G.	HQ-EL/Bergstrahl, J. T.	31-Atmos Sci
	HQ-EL/Quaide, W. L.	

NGT 00-070-125 University of California - Los Angeles 2155
 NASA graduate student researchers underrepresented minority focus program

<i>Period</i>	<i>Obligations</i>	
07/01/89-06/30/90	FY89: \$18,000 TOTAL: \$18,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Osher, S. J.	HQ-XE/Owens, F. C.	21-Mathematics

NSG 7315 University of California - Los Angeles 2163
 Theoretical studies of Moon plasma interactions

<i>Period</i>	<i>Obligations</i>	
02/01/77-09/30/89	FY89: \$25,300 TOTAL: \$423,802	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Schubert, G.	HQ-EL/Underwood, J. R.	32-Geological Sci
	HQ-EL/Boyce, J. M.	

NGT 05-006-800 University of California - Los Angeles 2156
 NASA graduate student researchers program

<i>Period</i>	<i>Obligations</i>	
06/01/85-05/31/88	FY89: TOTAL: \$54,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Wong, A. Y.	HQ-LE/Owens, F. C.	13-Physics

NAGW 709 University of California - Riverside 2164
 Solar wind plasma interaction with the Earth, Venus and comet Halley: A laboratory model

<i>Period</i>	<i>Obligations</i>	
02/01/85-11/30/89	FY89: \$72,000 TOTAL: \$226,456	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
White, R. S.	HQ-EL/Bergstrahl, J. T.	11-Astronomy
	HQ-EL/Quaide, W. L.	

NGT 05-006-801 University of California - Los Angeles 2157
 NASA graduate student researchers program

<i>Period</i>	<i>Obligations</i>	
07/01/85-06/30/88	FY89: TOTAL: \$54,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Nicol, M. F.	HQ-LE/Owens, F. C.	12-Chemistry

NGR 05-008-022 University of California - Riverside 2165
 Measurement of neutrons from Sun

<i>Period</i>	<i>Obligations</i>	
05/16/69-11/30/89	FY89: \$230,000 TOTAL: \$2,558,585	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
White, R. S.	HQ-EZ/Kaluzienski, L. J.	11-Astronomy
Zych, A. D.	HQ-EZ/Bunner, A. N.	

NSG 1490 University of California - Los Angeles 2158
 Fundamental studies of methods for structural synthesis

<i>Period</i>	<i>Obligations</i>	
02/01/80-09/30/91	FY89: \$240,000 TOTAL: \$1,386,899	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Schmit, L. A., Jr.	LARC/Sobieski, J.	49-Engr, NEC
Fleury, C.		

NGT 00-050-156 University of California - Riverside 2166
 NASA graduate student researchers program

<i>Period</i>	<i>Obligations</i>	
06/01/87-05/31/89	FY89: TOTAL: \$27,899	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Scott, G. W.	HQ-XE/Owens, F. C.	12-Chemistry

NSG 2290 University of California - Los Angeles 2159
 Research program in jet/surface interactions

<i>Period</i>	<i>Obligations</i>	
11/01/77-09/30/89	FY89: \$40,000 TOTAL: \$290,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Meecham, W. C.	ARC/Soderman, P.	41-Aero Engr
	ARC/Horne, W. C.	

NAG 1-823 University of California - San Diego 2167
 Design of catalytic monoliths for closed cycle carbon dioxide lasers

<i>Period</i>	<i>Obligations</i>	
11/01/87-01/31/89	FY89: TOTAL: \$24,995	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Herz, R. K.	LARC/Schryer, D. R.	43-Chem Engr
	LARC/Rose, L. J.	

NSG 4015 University of California - Los Angeles 2160
 Modelling, identification and control with applications to flight vehicles

<i>Period</i>	<i>Obligations</i>	
02/01/78-01/31/90	FY89: TOTAL: \$634,391	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Balakrishnan, A. V.	ARC/Illiff, K. W.	41-Aero Engr

NAG 1-889 University of California - San Diego 2168
 Investigation of the surface radiation budget from satellite observations

<i>Period</i>	<i>Obligations</i>	
06/01/88-05/31/90	FY89: \$35,944 TOTAL: \$69,978	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Gautier, C.	LARC/Whitlock, C. H.	31-Atmos Sci
	LARC/Suttles, J. T.	

NASA'S UNIVERSITY PROGRAM **CALIFORNIA (Continued)**

NAG 1-900 University of California - San Diego 2169
 Modeling of carbon monoxide oxidation kinetics over NASA carbon dioxide laser catalysts
Period Obligations
 07/15/88-09/30/89 FY89: TOTAL: \$23,500
Prin. Invest. NASA Tech. Officer CASE Category
 Herz, R. K. LARC/Schryer, D. R. 43-Chem Engr
 LARC/Hess, R. V.

NAG 1-1051 University of California - San Diego 2170
 Monolith catalysts for closed-cycle carbon dioxide lasers
Period Obligations
 09/01/89-11/30/90 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. NASA Tech. Officer CASE Category
 Herz, R. K. LARC/Schryer, D. R. 43-Chem Engr
 LARC/Rose, L. J.

NAG 2-153 University of California - San Diego 2171
 Pioneer 10 and 11 data analysis
Period Obligations
 01/01/82-02/28/90 FY89: \$150,006 TOTAL: \$1,024,835
Prin. Invest. NASA Tech. Officer CASE Category
 Fillius, W. ARC/Lasher, L. E. 19-Phys Sci, NEC
 ARC/Phillips, J. R.

NAG 2-506 University of California - San Diego 2172
 Evaluation of ADA technology
Period Obligations
 03/01/88-06/30/89 FY89: \$19,996 TOTAL: \$59,996
Prin. Invest. NASA Tech. Officer CASE Category
 Arnold, J. R. ARC/Goforth, A. 29-Math/Computer, NEC
 Collard, P. E. ARC/Lum, H.

NAG 2-580 University of California - San Diego 2173
 Low background IR array testing
Period Obligations
 02/01/89-01/31/90 FY89: \$50,498 TOTAL: \$50,498
Prin. Invest. NASA Tech. Officer CASE Category
 Puetter, R. C. ARC/McCreight, C. R. 11-Astronomy
 Jones, B. ARC/McMurray, R. E.

NAG 2-586 University of California - San Diego 2174
 Nitrous oxide standard calibrations
Period Obligations
 05/15/89-11/14/89 FY89: \$10,826 TOTAL: \$10,826
Prin. Invest. NASA Tech. Officer CASE Category
 Weiss, R. F. ARC/Wegener, S. S. 31-Atmos Sci

NAG 3-925 University of California - San Diego 2175
 Flame propagation and extinction particulates
Period Obligations
 10/15/88-10/14/89 FY89: \$139,000 TOTAL: \$149,000
Prin. Invest. NASA Tech. Officer CASE Category
 Berlad, A. L. LERC/Ross, H. D. 46-Mech Engr

NAG 3-1015 University of California - San Diego 2176
 The y ba cu oxide and bi SR ca cu oxide high tc superconductors with emphasis on thin film deposition
Period Obligations
 02/10/89-06/09/89 FY89: \$25,000 TOTAL: \$25,000
Prin. Invest. NASA Tech. Officer CASE Category
 Luo, H. L. LERC/Alterovitz, S. A. 45-Elec Engr
 LERC/Aron, P. R.

NAG 5-236 University of California - San Diego 2177
 Effects of global tropical weather satellite data on planetary waves
Period Obligations
 05/15/82-04/30/90 FY89: \$75,000 TOTAL: \$538,713
Prin. Invest. NASA Tech. Officer CASE Category
 Somerville, R. C. GSFC/Suarez, M. 31-Atmos Sci
 Roads, J.

NAG 5-530 University of California - San Diego 2178
 Relative and gamma-ray spectrometer X ray spectrometric development
Period Obligations
 04/01/85-06/30/90 FY89: \$39,953 TOTAL: \$165,651
Prin. Invest. NASA Tech. Officer CASE Category
 Arnold, J. GSFC/Trombka, J. I. 32-Geological Sci
 GSFC/Schmadebeck, R. L.

NAG 5-818 University of California - San Diego 2179
 Contributions from geomagnetic inverse theory to the study of hydromagnetic conditions near the core mantle boundary
Period Obligations
 08/01/86-08/31/90 FY89: \$38,000 TOTAL: \$142,929
Prin. Invest. NASA Tech. Officer CASE Category
 Backus, G. E. GSFC/Langel, R. A. 32-Geological Sci

NAG 5-883 University of California - San Diego 2180
 Constructing core fields consistent with geosynthetic data and geophysical constraints
Period Obligations
 06/15/87-11/30/89 FY89: TOTAL: \$137,210
Prin. Invest. NASA Tech. Officer CASE Category
 Backus, G. GSFC/Langel, R. 32-Geological Sci
 Parker, R. L.
 Stark, P. B.

NAG 5-900 University of California - San Diego 2181
 Variation of the net surface radiation flux from satellite radiances
Period Obligations
 05/01/87-07/31/90 FY89: \$161,000 TOTAL: \$253,943
Prin. Invest. NASA Tech. Officer CASE Category
 Gautier, C. H. GSFC/Choudhury, B. 39-Env Sci, NEC
 Frouin, R. GSFC/Hall, F.

NAG 5-905 University of California - San Diego 2182
 Statistical description of tectonic motions analysis of crustal dynamics observations
Period Obligations
 04/15/87-05/14/90 FY89: \$70,332 TOTAL: \$194,272
Prin. Invest. NASA Tech. Officer CASE Category
 Agnew, D. C. GSFC/Frey, H. V. 32-Geological Sci

NAG 5-945 University of California - San Diego 2183
 Determination of solar flare accelerated ion angular distributions
Period Obligations
 07/01/87-08/31/89 FY89: TOTAL: \$56,129
Prin. Invest. NASA Tech. Officer CASE Category
 Lingenfelter, R. E. GSFC/Bullock, G. D. 19-Phys Sci, NEC
 GSFC/Gurman, J. B.

NAG 5-1022 University of California - San Diego 2184
 Analysis of multispectral airborne radiometer system data
Period Obligations
 11/01/87-04/30/89 FY89: TOTAL: \$25,600
Prin. Invest. NASA Tech. Officer CASE Category
 Mueller, J. L. GSFC/Maynard, N. G. 33-Oceanography

NASA'S UNIVERSITY PROGRAM CALIFORNIA (Continued)

NAG 5-1023 University of California - San Diego 2185
Plate motions and deformations from geologic and geodetic data
Period *Obligations*
11/01/87-10/31/89 FY89: \$73,244 TOTAL: \$153,859
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Gaskell, C. GSFC/Frey, H. 32-Geological Sci
Jordan, T. H.

NAG 5-1028 University of California - San Diego 2186
Microprocessor design review services
Period *Obligations*
12/15/87-06/30/89 FY89: TOTAL: \$15,793
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Filius, W. F. GSFC/Scudder, J. D. 19-Phys Sci, NEC
GSFC/Ogilvie, K. W.

NAG 5-1071 University of California - San Diego 2187
Origins of solar luminosity variations
Period *Obligations*
10/01/88-09/30/89 FY89: TOTAL: \$32,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hudson, H. GSFC/Bullock, G. D. 19-Phys Sci, NEC
GSFC/Gurman, J. B.

NAG 5-1209 University of California - San Diego 2188
Cloud kinematics in the broad emission-line regions of quasi-stellar objects
Period *Obligations*
08/01/89-07/31/90 FY89: \$20,000 TOTAL: \$20,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Junkkarinen, V. GSFC/West, D. 11-Astronomy

NAG 5-1210 University of California - San Diego 2189
Investigation of heating processes in cooling flow clusters
Period *Obligations*
08/01/89-07/31/90 FY89: \$24,000 TOTAL: \$24,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Tucker, W. GSFC/West, D. 11-Astronomy

NAG 5-1266 University of California - San Diego 2190
Geodynamic applications of GEOSAT ERM altimetry
Period *Obligations*
10/01/89-02/28/90 FY89: \$45,000 TOTAL: \$45,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Sandwell, D. T. GSFC/Welker, J. E. 32-Geological Sci

NAG 8-499 University of California - San Diego 2191
Hard X-ray and low energy gamma-ray experiment: HEAO-1 data reduction and analysis
Period *Obligations*
10/01/84-09/30/89 FY89: \$60,000 TOTAL: \$342,963
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Gruber, D. F. MSFC/Havrisik, D. M. 11-Astronomy

NAG 8-645 University of California - San Diego 2192
Investigation of the stability of the 60 day cycle SMC x 1
Period *Obligations*
06/05/87-10/04/88 FY89: TOTAL: \$29,657
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Gruber, D. E. MSFC/Harper, B. 12-Chemistry

NAG 8-663 University of California - San Diego 2193
Analysis of HEAO 1 A 4 observations of 3 Abell clusters of galaxies
Period *Obligations*
07/10/87-07/09/88 FY89: TOTAL: \$17,997
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Gruber, D. E. MSFC/Harper, B. 11-Astronomy

NAG 8-739 University of California - San Diego 2194
Variability of X ray pulsars
Period *Obligations*
07/01/88-12/29/89 FY89: TOTAL: \$32,310
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Gruben, D. E. MSFC/Harper, B. 11-Astronomy

NAG 8-742 University of California - San Diego 2195
Scientific tradeoffs in pinhole/occulter facility accommodation
Period *Obligations*
07/18/88-10/17/88 FY89: TOTAL: \$24,249
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hudson, H. S. MSFC/Dabbs, J. R. 11-Astronomy

NAG 8-773 University of California - San Diego 2196
Scientific requirements for the accommodation of the pinhole occulter facility of the space station freedom
Period *Obligations*
03/31/89-03/31/90 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hudson, H. S. MSFC/Dabbs, J. R. 11-Astronomy

NAG 9-33 University of California - San Diego 2197
Historical studies on extraterrestrial materials
Period *Obligations*
02/01/83-02/01/90 FY89: \$149,000 TOTAL: \$992,790
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Arnold, J. R. JSC/Browne, I. D. 12-Chemistry

NAG 9-41 University of California - San Diego 2198
Fragmentary solar system history
Period *Obligations*
02/01/83-02/01/90 FY89: \$110,000 TOTAL: \$850,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Marti, K. JSC/Browne, I. D. 12-Chemistry
Lugmair, G. W.

NAG 9-49 University of California - San Diego 2199
Isotopic, chemical and mineralogical investigations of extraterrestrial materials
Period *Obligations*
02/01/83-12/01/89 FY89: \$229,383 TOTAL: \$1,721,052
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lugmair, G. W. JSC/Browne, I. D. 32-Geological Sci

NAG 9-83 University of California - San Diego 2200
Oxygen isotopic anomalies in meteorites: Supernovae and light
Period *Obligations*
03/01/84-03/01/90 FY89: \$30,001 TOTAL: \$261,462
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Thiemens, M. H. JSC/Browne, I. D. 32-Geological Sci

NAG 9-186 University of California - San Diego 2201
Advanced propulsion method for transport of lunar materials
Period *Obligations*
09/15/86-06/01/89 FY89: TOTAL: \$175,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Arnold, J. R. JSC/Roberts, B. B. 42-Astro Engr

NASA'S UNIVERSITY PROGRAM **CALIFORNIA (Continued)**

NAG 9-271 University of California - San Diego 2202
Pulmonary function during microgravity
Period Obligations
03/01/88-05/01/90 FY89: \$105,000 TOTAL: \$185,000
Prin. Invest. NASA Tech. Officer CASE Category
West, J. B. JSC/Charles, J. B. 56-Medical Sciences

NAG 9-353 University of California - San Diego 2203
Bias analysis of the near Earth asteroid population
Period Obligations
03/01/89-01/01/90 FY89: \$56,557 TOTAL: \$56,557
Prin. Invest. NASA Tech. Officer CASE Category
McFadden, L. A. JSC/Vilas, F. 11-Astronomy

NAGW 20 University of California - San Diego 2204
Mechanism of synthesis of amino, hydroly and dicarboxlec acids in carbonaceous chondrites
Period Obligations
12/01/79-11/30/89 FY89: \$56,890 TOTAL: \$524,390
Prin. Invest. NASA Tech. Officer CASE Category
Miller, S. R. HQ-EB/Rummel, J. D. 32-Geological Sci
HQ-EB/Averner, M.

NAGW 449 University of California - San Diego 2205
High resolution gamma-ray spectroscopy of cosmic sources
Period Obligations
04/15/83-01/31/90 FY89: \$1,437,000 TOTAL: \$6,452,095
Prin. Invest. NASA Tech. Officer CASE Category
Matteson, J. L. HQ-EZ/Kaluziński, L. J. 11-Astronomy
HQ-EZ/Bunner, A. N.

NAGW 585 University of California - San Diego 2206
Analysis of solar variability
Period Obligations
04/01/84-03/31/88 FY89: TOTAL: \$202,000
Prin. Invest. NASA Tech. Officer CASE Category
Hudson, H. S. HQ-EZ/Spicer, D. S. 13-Physics

NAGW 629 University of California - San Diego 2207
Research grant-program on space station automation
Period Obligations
05/19/84-01/01/89 FY89: TOTAL: \$658,437
Prin. Invest. NASA Tech. Officer CASE Category
Arnold, J. R. HQ-ST/Solloway, C. B. 99-Multi-Discip
HQ-ST/Swietek, G. E.

NAGW 683 University of California - San Diego 2208
Support of satellite oceanography experiments
Period Obligations
12/01/84-12/31/89 FY89: \$284,891 TOTAL: \$640,950
Prin. Invest. NASA Tech. Officer CASE Category
Simpson, J. J. HQ-EE/Lewis, M. R. 33-Oceanography
HQ-EE/Wilson, W. S.

NAGW 897 University of California - San Diego 2209
Pulmonary function in weightlessness extended data analysis
Period Obligations
06/01/86-03/31/90 FY89: \$32,663 TOTAL: \$130,957
Prin. Invest. NASA Tech. Officer CASE Category
West, J. B. HQ-EB/White, R. J. 51-Biological Sci

NAGW 972 University of California - San Diego 2210
Carbon isotopes in polar ice core methane
Period Obligations
10/01/86-10/31/89 FY89: TOTAL: \$95,395
Prin. Invest. NASA Tech. Officer CASE Category
George, W. M. HQ-EE/Kurylo, M. J. 39-Env Sci, NEC
Horibe, Y. HQ-EE/Watson, R. T.

NAGW 981 University of California - San Diego 2211
Air sea interactions and the Indian monsoon satellite and modeling studies
Period Obligations
10/01/86-09/30/89 FY89: \$174,710 TOTAL: \$549,710
Prin. Invest. NASA Tech. Officer CASE Category
Gautier, C. HQ-EE/Dodge, J. C. 39-Env Sci, NEC
Sommerville, R. C. HQ-EE/Theon, J. S.

NAGW 993 University of California - San Diego 2212
Assessing ocean productivity from satellite measurements
Period Obligations
10/01/86-06/30/90 FY89: \$119,400 TOTAL: \$302,438
Prin. Invest. NASA Tech. Officer CASE Category
Eppley, R. W. HQ-EE/Lewis, M. R. 33-Oceanography
Abbott, M. R. HQ-EE/Wilson, W. S.

NAGW 1031 University of California - San Diego 2213
Rust minerals as templates for organic molecules
Period Obligations
01/01/87-12/31/89 FY89: \$79,124 TOTAL: \$274,223
Prin. Invest. NASA Tech. Officer CASE Category
Arrhenius, G. HQ-EB/Rummel, J. D. 51-Biological Sci

NAGW 1038 University of California - San Diego 2214
Assessment of altimeter satellite accuracy
Period Obligations
03/01/87-03/28/89 FY89: TOTAL: \$74,689
Prin. Invest. NASA Tech. Officer CASE Category
Stewart, R. H. HQ-EE/Richman, J. G. 33-Oceanography
HQ-EE/Wilson, W. S.

NAGW 1070 University of California - San Diego 2215
Analysis of data from a six month bio optical mooring
Period Obligations
04/01/87-03/31/90 FY89: TOTAL: \$185,415
Prin. Invest. NASA Tech. Officer CASE Category
Holm-hansen, O. HQ-EE/Yoder, J. A. 33-Oceanography
HQ-EE/Wilson, W. S.

NAGW 1126 University of California - San Diego 2216
Ocean storms array bottom pressure
Period Obligations
07/01/87-12/31/89 FY89: \$45,126 TOTAL: \$174,386
Prin. Invest. NASA Tech. Officer CASE Category
Filloux, J. H. HQ-EE/Lagerloef, G. S. 33-Oceanography
Niiler, P. HQ-EE/Wilson, W. S.

NAGW 1136 University of California - San Diego 2217
Optical evaluation of Aviris performance over case II waters
Period Obligations
06/01/87-12/31/89 FY89: TOTAL: \$125,022
Prin. Invest. NASA Tech. Officer CASE Category
Mueller, J. L. HQ-EE/Wickland, D. 33-Oceanography
HQ-EE/Ruzek, M.

NASA'S UNIVERSITY PROGRAM CALIFORNIA (Continued)

NAGW 1141	University of California - San Diego	2218
The development of a prototype software system for education and research on the Earth's atmosphere and surface		
<i>Period</i>	<i>Obligations</i>	
08/01/87-07/31/90	FY89: \$60,000	TOTAL: \$180,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Gautier, C. H.	HQ-EE/Butler, D. M.	31-Atmos Sci
	HQ-EE/Theon, J. S.	
NAGW 1150	University of California - San Diego	2219
Use of generalized adiabatic theory to study magnetospheric current sheets and plasma boundary layers		
<i>Period</i>	<i>Obligations</i>	
08/15/87-12/31/89	FY89: \$83,000	TOTAL: \$162,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Whipple, E. C.	HQ-ES/Mellott, M. M.	13-Physics
	HQ-ES/Perry, T. W.	
NAGW 1237	University of California - San Diego	2220
Satellite and ship studies of the California current during and after the 1982 el nino		
<i>Period</i>	<i>Obligations</i>	
12/01/87-06/30/89	FY89: \$20,073	TOTAL: \$61,178
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Stewart, R. H.	HQ-EE/Yoder, J. A.	33-Oceanography
	HQ-EE/Wilson, W. S.	
NAGW 1271	University of California - San Diego	2221
Experimental and theoretical determination of sea state bias in radar altimetry		
<i>Period</i>	<i>Obligations</i>	
01/01/88-04/30/89	FY89:	TOTAL: \$60,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Stewart, R. H.	HQ-EE/Richman, J. G.	33-Oceanography
	HQ-EE/Wilson, W. S.	
NAGW 1274	University of California - San Diego	2222
Asteroid and comet surfaces properties		
<i>Period</i>	<i>Obligations</i>	
01/01/88-12/31/88	FY89:	TOTAL: \$30,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
McFadden, L. A.	HQ-EL/Brinton, H. C.	59-Life Sci, NEC
	HQ-EL/Rahe, J. H.	
NAGW 1399	University of California - San Diego	2223
Analysis of the contribution of starburst galaxies to the cosmic X-ray background		
<i>Period</i>	<i>Obligations</i>	
06/27/88-06/26/89	FY89:	TOTAL: \$10,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Gruber, D. E.	HQ-EZ/Kaluzienski, L. J.	11-Astronomy
NAGW 1502	University of California - San Diego	2224
Small bodies in the solar comets		
<i>Period</i>	<i>Obligations</i>	
12/01/88-11/30/89	FY89: \$72,000	TOTAL: \$72,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Mendis, D. A.	HQ-EL/Bergstralh, J. T.	11-Astronomy
NAGW 1523	University of California - San Diego	2225
Laboratory experiments for astero-seismology		
<i>Period</i>	<i>Obligations</i>	
01/01/89-12/31/89	FY89: \$89,711	TOTAL: \$89,711
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hudson, H.	HQ-EZ/Clayton, G. C.	11-Astronomy
NAGW 1712	University of California - San Diego	2226
Numerical studies of collisionless current layers		
<i>Period</i>	<i>Obligations</i>	
04/01/89-03/31/90	FY89: \$70,000	TOTAL: \$70,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Quest, K. B.	HQ-ES/Mellott, M. M.	13-Physics
	HQ-ES/Perry, T. W.	
NAGW 1737	University of California - San Diego	2227
Properties of quasi stellar objects		
<i>Period</i>	<i>Obligations</i>	
04/01/89-03/31/90	FY89: \$81,919	TOTAL: \$81,919
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Burbidge, G. R.	HQ-EZ/Clayton, G.	99-Multi-Discip
NAGW 1806	University of California - San Diego	2228
A kinetic study of the solar wind coma interaction		
<i>Period</i>	<i>Obligations</i>	
07/15/89-10/31/89	FY89: \$27,573	TOTAL: \$27,573
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Omid, N.	HQ-ES/Mellott, M. M.	13-Physics
	HQ-ES/Perry, T. W.	
NAGW 1837	University of California - San Diego	2229
Research in high energy astrophysics		
<i>Period</i>	<i>Obligations</i>	
07/01/89-06/30/90	FY89: \$61,507	TOTAL: \$61,507
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Peterson, L. E.	HQ-EZ/Kaluzienski, L. J.	31-Atmos Sci
NAS 3-24639	University of California - San Diego	2230
Scientific support for a Space Shuttle particle cloud combustion experiment		
<i>Period</i>	<i>Obligations</i>	
09/01/85-04/30/89	FY89:	TOTAL: \$515,525
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Berlad, A. L.	LERC/Sacksteder, K. R.	49-Engr, NEC
NAS 5-24463	University of California - San Diego	2231
Faint object spectrograph for space telescope		
<i>Period</i>	<i>Obligations</i>	
09/15/78-04/30/90	FY89: \$1,505,000	TOTAL: \$45,727,566
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Harms, R. J.	GSFC/Shannon, J. L.	11-Astronomy
	GSFC/Sours, W. P.	
NAS 5-25054	University of California - San Diego	2232
Development of digital image tubes		
<i>Period</i>	<i>Obligations</i>	
05/01/78-09/30/89	FY89:	TOTAL: \$629,910
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Beaver, E. A.	GSFC/Shannon, J. L.	11-Astronomy
NAS 5-26854	University of California - San Diego	2233
Electric field investigation by electron drift studies (EFIELDS)		
<i>Period</i>	<i>Obligations</i>	
06/15/82-12/31/89	FY89: \$4,773	TOTAL: \$408,455
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
McIlwain, C. E.	GSFC/O'Brien, J. J.	13-Physics

NASA'S UNIVERSITY PROGRAM **CALIFORNIA (Continued)**

NAS 5-29117 University of California - San Diego 2234
 High energy X ray timing experiment (HEXTE)
Period Obligations
 03/19/85-10/31/89 FY89: \$1,069,673 TOTAL: \$2,714,386
Prin. Invest. NASA Tech. Officer CASE Category
 Rothschild, R. GSFC/Schulz, D. 42-Astro Engr

NAS 5-29293 University of California - San Diego 2235
 The Hubble space telescope guaranteed time observation program
Period Obligations
 04/14/86-05/31/91 FY89: \$2,227,000 TOTAL: \$6,337,000
Prin. Invest. NASA Tech. Officer CASE Category
 Baity, W. GSFC/Kalinowski, J. K. 41-Aero Engr
 Burbidge, M.

NAS 5-30107 University of California - San Diego 2236
 Guaranteed time observations of the high resolution spectrograph
Period Obligations
 07/13/87-09/30/91 FY89: \$23,000 TOTAL: \$143,500
Prin. Invest. NASA Tech. Officer CASE Category
 Beaver, E. A. GSFC/Vitagliano, A. D. 11-Astronomy

NAS 5-30338 University of California - San Diego 2237
 Phase A study of a nuclear astrophysics Explorer mission
Period Obligations
 06/07/88-07/02/89 FY89: \$159,042 TOTAL: \$278,042
Prin. Invest. NASA Tech. Officer CASE Category
 Matteson, J. L. GSFC/Muller, R. 11-Astronomy

NAS 5-30378 University of California - San Diego 2238
 Definition phase for electron drift instrument for ISTP cluster mission
Period Obligations
 10/14/88-09/30/89 FY89: \$490,933 TOTAL: \$490,933
Prin. Invest. NASA Tech. Officer CASE Category
 McIlwain, C. GSFC/Stich, K. 13-Physics

NAS 5-30549 University of California - San Diego 2239
 Development of in flight software and data analysis for the GGS polar hydra experiment
Period Obligations
 06/06/89-05/31/95 FY89: \$550,000 TOTAL: \$550,000
Prin. Invest. NASA Tech. Officer CASE Category
 Fillius, W. GSFC/Scudder, J. 22-Computer Science

NAS 8-36081 University of California - San Diego 2240
 Burst and transient source experiment (BATSE) spectroscopy detector (SD)
Period Obligations
 06/01/84-12/31/92 FY89: TOTAL: \$2,116,891
Prin. Invest. NASA Tech. Officer CASE Category
 Matteson, J. L. MSFC/Schrick, B. J. 11-Astronomy

NAS 9-16037 University of California - San Diego 2241
 Pulmonary functions during weightlessness
Period Obligations
 01/17/80-12/01/90 FY89: \$436,200 TOTAL: \$4,243,700
Prin. Invest. NASA Tech. Officer CASE Category
 West, C. JSC/Davis, C. 59-Life Sci, NEC

NASW 3667 University of California - San Diego 2242
 Development of a charged-coupled-device digicon for space astronomy
Period Obligations
 10/01/82-01/31/90 FY89: TOTAL: \$458,983
Prin. Invest. NASA Tech. Officer CASE Category
 Hier, R. G. HQ-EZ/Weiler, E. J. 11-Astronomy
 HQ-EZ/Stencel, R. E.

NCA 2-225 University of California - San Diego 2243
 Limitations in performing multiple sensorimotor tasks simultaneously
Period Obligations
 07/01/87-06/30/89 FY89: TOTAL: \$42,374
Prin. Invest. NASA Tech. Officer CASE Category
 Pashler, H. ARC/Johnston, J. C. 69-Psych, NEC

NCA 2-414 University of California - San Diego 2244
 The modulation of dual task interference by response processing joint research interchange
Period Obligations
 07/01/89-06/30/91 FY89: \$21,449 TOTAL: \$21,449
Prin. Invest. NASA Tech. Officer CASE Category
 Pashler, H. E. ARC/Johnston, J. C. 61-Biol Aspects

NCC 2-556 University of California - San Diego 2245
 Quantitation of disuse alterations in human musculoskeletal tissue as a model for weightlessness
Period Obligations
 09/01/88-10/31/89 FY89: TOTAL: \$23,000
Prin. Invest. NASA Tech. Officer CASE Category
 Sartoris, D. J. ARC/Hargens, A. R. 56-Medical Sciences

NCC 2-557 University of California - San Diego 2246
 The metabolic changes in particular connective tissue during weightlessness
Period Obligations
 09/01/88-10/31/89 FY89: \$30,000 TOTAL: \$30,000
Prin. Invest. NASA Tech. Officer CASE Category
 Amiel, D. ARC/Hargens, A. 51-Biological Sci
 Harper, E.
 Harper, J. H.

NCC 2-591 University of California - San Diego 2247
 Distributed cognition in aviation
Period Obligations
 02/01/89-01/31/90 FY89: \$152,384 TOTAL: \$152,384
Prin. Invest. NASA Tech. Officer CASE Category
 Norman, D. A. ARC/Palmer, E. A. 62-Social Aspects
 Hutchins, E. L. ARC/Hofstrand, R. R.

NCC 2-598 University of California - San Diego 2248
 Comparison of NASTRAN analysis with ground vibration results of UH 60a NASA AEFA test configuration
Period Obligations
 01/01/89-03/31/90 FY89: \$39,146 TOTAL: \$39,146
Prin. Invest. NASA Tech. Officer CASE Category
 Seible, F. ARC/Kufeld, R. M. 41-Aero Engr
 Idosor, F. ARC/Madden, J.

NCC 2-603 University of California - San Diego 2249
 Parallel ADA benchmarks for the SVMS
Period Obligations
 04/01/89-12/31/89 FY89: \$115,771 TOTAL: \$115,771
Prin. Invest. NASA Tech. Officer CASE Category
 Collard, P. ARC/Goforth, A. 22-Computer Science
 ARC/Lim, R.

**NASA'S UNIVERSITY PROGRAM
CALIFORNIA (Continued)**

NGL 05-005-004 University of California - San Diego 2250
Theoretical studies in astrophysics

Period	Obligations	
02/04/63-09/30/89	FY89: \$63,414	TOTAL: \$1,229,153
Prin. Invest.	NASA Tech. Officer	CASE Category
Gould, R. J.	HQ-EZ/Kaluzienski, L. J.	11-Astronomy
	HQ-EZ/Bunner, A. N.	

NGL 05-005-007 University of California - San Diego 2251
Study of geomagnetically trapped particles by Explorer and Injun satellite data, refining particle detectors, detector systems and telemetered data processing equipment

Period	Obligations	
02/20/64-09/30/89	FY89: \$135,000	TOTAL: \$4,536,364
Prin. Invest.	NASA Tech. Officer	CASE Category
McIlwain, C. E.	HQ-ES/Desch, M. D.	13-Physics
	HQ-EE/Eastman, T. E.	

NGR 05-009-110 University of California - San Diego 2252
The structure and evolution of the asteroid belt

Period	Obligations	
01/23/70-11/30/88	FY89:	TOTAL: \$1,057,690
Prin. Invest.	NASA Tech. Officer	CASE Category
Mendis, D. A.	HQ-EL/Fox, K.	11-Astronomy
Alfven, H.	HQ-EL/Quaide, W. L.	

NGT 00-050-057 University of California - San Diego 2253
NASA graduate student researchers program

Period	Obligations	
09/22/86-09/20/90	FY89: \$18,000	TOTAL: \$54,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Somerville, R. C.	HQ-XE/Owens, F. C.	33-Oceanography

NGT 00-050-131 University of California - San Diego 2254
NASA graduate student researchers program

Period	Obligations	
06/15/87-06/14/88	FY89:	TOTAL: \$17,991
Prin. Invest.	NASA Tech. Officer	CASE Category
McIlwain, C. E.	HQ-LE/Owens, F. C.	13-Physics

NGT 00-050-158 University of California - San Diego 2255
NASA graduate student researchers program

Period	Obligations	
06/01/87-12/31/89	FY89: \$11,930	TOTAL: \$47,754
Prin. Invest.	NASA Tech. Officer	CASE Category
Abbott, M. R.	HQ-XE/Owens, F. C.	33-Oceanography

NGT 00-050-159 University of California - San Diego 2256
NASA graduate student researchers program

Period	Obligations	
06/01/87-05/31/89	FY89:	TOTAL: \$34,655
Prin. Invest.	NASA Tech. Officer	CASE Category
Lee, S. H.	HQ-XE/Owens, F. C.	13-Physics

NGT 00-050-160 University of California - San Diego 2257
NASA graduate student researchers program

Period	Obligations	
06/15/87-06/14/90	FY89: \$18,000	TOTAL: \$54,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Agnew, D. C.	HQ-XE/Owens, F. C.	13-Physics

NGT 00-050-174 University of California - San Diego 2258
NASA graduate student researchers program

Period	Obligations	
06/01/87-05/31/88	FY89:	TOTAL: \$18,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Thiemens, M. H.	HQ-XE/Owens, F. C.	12-Chemistry

NGT 00-050-175 University of California - San Diego 2259
NASA graduate student researchers program

Period	Obligations	
06/01/87-06/13/90	FY89: \$17,712	TOTAL: \$53,354
Prin. Invest.	NASA Tech. Officer	CASE Category
Matteson, J. L.	HQ-XE/Owens, F. C.	13-Physics

NGT 00-050-277 University of California - San Diego 2260
NASA graduate student researchers program

Period	Obligations	
08/01/88-07/31/90	FY89: \$16,745	TOTAL: \$16,745
Prin. Invest.	NASA Tech. Officer	CASE Category
Felbeck, H.	HQ-XE/Owens, F. C.	51-Biological Sci
Stein, J. L.		

NGT 00-050-296 University of California - San Diego 2261
NASA graduate student researchers program

Period	Obligations	
08/01/88-07/31/90	FY89: \$2,000	TOTAL: \$17,913
Prin. Invest.	NASA Tech. Officer	CASE Category
Miller, S. L.	HQ-XE/Owens, F. C.	12-Chemistry

NGT 00-050-304 University of California - San Diego 2262
NASA graduate student researchers program

Period	Obligations	
09/01/88-08/31/90	FY89: \$18,000	TOTAL: \$36,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Gautier, C.	HQ-XE/Owens, F. C.	33-Oceanography

NGT 00-070-138 University of California - San Diego 2263
NASA graduate student researchers underrepresented minority focus program

Period	Obligations	
07/01/89-06/30/90	FY89: \$18,000	TOTAL: \$18,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Puetter, R.	HQ-XE/Owens, F. C.	13-Physics

NSG 7161 University of California - San Diego 2264
Analysis and interpretation of solar X-ray data from OSO-7

Period	Obligations	
07/01/75-10/31/89	FY89: \$80,000	TOTAL: \$1,024,453
Prin. Invest.	NASA Tech. Officer	CASE Category
Hudson, H. S.	HQ-ES/Bohlin, J. D.	13-Physics

NSG 7541 University of California - San Diego 2265
Theoretical studies in gamma ray line astronomy

Period	Obligations	
02/01/80-12/31/89	FY89: \$130,330	TOTAL: \$716,534
Prin. Invest.	NASA Tech. Officer	CASE Category
Lingenfelter, R. E.	HQ-EZ/Kaluzienski, L. J.	11-Astronomy
	HQ-EZ/Bunner, A. N.	

NASA'S UNIVERSITY PROGRAM CALIFORNIA (Continued)

NSG 7623 University of California - San Diego 2266
The new plasmas and its applications to planetary magnetospheres and the heliosphere

Period	Obligations	
07/01/79-06/30/90	FY89: \$100,000	TOTAL: \$912,957
Prin. Invest.	NASA Tech. Officer	CASE Category
Alfven, H.	HQ-ES/Mellott, M. M.	19-Phys Sci, NEC
Whipple, E. C.	HQ-EE/Eastman, T. E.	

NAG 2-434 University of California - San Francisco 2267
Neural mechanisms by which gravitational stimuli and stress affect the secretion of the renin and other hormones

Period	Obligations	
02/01/87-08/31/89	FY89:	TOTAL: \$116,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Ganong, W. F.	ARC/Holton, E. M.	51-Biological Sci

NAG 9-157 University of California - San Francisco 2268
Measurement of vertebral mineral using quantitative computed tomography

Period	Obligations	
06/01/86-01/01/89	FY89:	TOTAL: \$296,550
Prin. Invest.	NASA Tech. Officer	CASE Category
Genant, H. K.	JSC/Schneider, V. S.	59-Life Sci, NEC

NAG 9-327 University of California - San Francisco 2269
Theoretical and practical limits of the NASA computed tomodensitometer for quantitative computed tomography

Period	Obligations	
04/01/88-04/01/90	FY89: \$235,961	TOTAL: \$235,961
Prin. Invest.	NASA Tech. Officer	CASE Category
Cann, C. E.	JSC/Schneider, V. S.	56-Medical Sciences

NAG 9-343 University of California - San Francisco 2270
Oct developments and applications

Period	Obligations	
01/01/89-01/01/90	FY89: \$100,000	TOTAL: \$100,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Genant, H. K.	JSC/Schneider, V. S.	56-Medical Sciences

NAGW 891 University of California - San Francisco 2271
The long term integrated radiation environment of a 500km altitude 28.5 degree inclination orbit, a part of the free flyer biostack experiment A0015 of the LDEF 1 mission

Period	Obligations	
04/15/86-10/14/88	FY89:	TOTAL: \$110,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Benton, E. V.	HQ-EB/White, R.	13-Physics

NAGW 1244 University of California - San Francisco 2272
Mechanism of control of bone growth by prostaglandis

Period	Obligations	
01/01/88-12/31/89	FY89: \$82,499	TOTAL: \$199,729
Prin. Invest.	NASA Tech. Officer	CASE Category
Fulford, M. H.	HQ-EB/Halstead, T. W.	51-Biological Sci

NAGW 1611 University of California - San Francisco 2273
Neural mechanisms by which gravitational stimuli and stress affect the secretion of renin and other hormones

Period	Obligations	
02/01/89-01/31/90	FY89: \$60,000	TOTAL: \$60,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Ganong, W. F.	HQ-EB/Halstead, T. W.	51-Biological Sci

NAS 9-16227 University of California - San Francisco 2274
Pathophysiology of mineral loss during increased urinary and fecal calcium excretion

Period	Obligations	
03/01/80-12/01/90	FY89: \$82,000	TOTAL: \$734,697
Prin. Invest.	NASA Tech. Officer	CASE Category
Arnaud, C. D.	JSC/Newkirk, K. E.	59-Life Sci, NEC

NCC 2-115 University of California - San Francisco 2275
A preventive method for the zero-gravity sickness syndrome

Period	Obligations	
01/01/81-09/30/89	FY89: \$287,689	TOTAL: \$1,917,248
Prin. Invest.	NASA Tech. Officer	CASE Category
Kamiya, J. J.	ARC/Kirk, P. J.	56-Medical Sciences

NCC 2-194 University of California - San Francisco 2276
The role of low and high pressure baroreceptors in the control of fluid balance

Period	Obligations	
06/01/82-10/31/89	FY89:	TOTAL: \$161,035
Prin. Invest.	NASA Tech. Officer	CASE Category
Ramsay, D. J.	ARC/Keil, L. C.	59-Life Sci, NEC

NCC 2-328 University of California - San Francisco 2277
The effect of skeletal unloading on bone formation

Period	Obligations	
11/01/84-10/31/89	FY89: \$85,000	TOTAL: \$560,205
Prin. Invest.	NASA Tech. Officer	CASE Category
Bikle, D. D.	ARC/Holton, E. M.	51-Biological Sci
Halloran, B.		

NCC 2-354 University of California - San Francisco 2278
Neural and hormonal mechanisms affecting adrenal responses

Period	Obligations	
08/01/85-11/14/89	FY89: \$38,506	TOTAL: \$145,284
Prin. Invest.	NASA Tech. Officer	CASE Category
Dallman, M. F.	ARC/Danellis, J. V.	51-Biological Sci
	ARC/Keil, L. C.	

NCC 2-491 University of California - San Francisco 2279
The neuroanatomical substrate of vomiting

Period	Obligations	
06/01/87-12/31/89	FY89: \$125,724	TOTAL: \$213,015
Prin. Invest.	NASA Tech. Officer	CASE Category
Ralston, H. J.	ARC/Corcoran, M. L.	51-Biological Sci
Holstege, G.	ARC/Daunton, N. G.	
Mehler, W. R.		

NCC 2-589 University of California - San Francisco 2280
Gravity and skeletal growth

Period	Obligations	
11/01/88-10/31/89	FY89: \$174,543	TOTAL: \$174,543
Prin. Invest.	NASA Tech. Officer	CASE Category
Holton, E. M.	ARC/Arnaud, S. B.	51-Biological Sci

NCC 2-597 University of California - San Francisco 2281
Bone calcium and spaceflight

Period	Obligations	
04/01/89-03/31/90	FY89: \$9,940	TOTAL: \$9,940
Prin. Invest.	NASA Tech. Officer	CASE Category
Cann, C. E.	ARC/Holton, E. M.	51-Biological Sci

NASA'S UNIVERSITY PROGRAM CALIFORNIA (Continued)

NGT 05-029-801 University of California - San Francisco 2282
NASA graduate student researchers program

Period	Obligations	
09/15/85-09/14/89	FY89:	TOTAL: \$72,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Bikle, D.	HQ-LE/Owens, F. C.	51-Biological Sci

NAG 1-567 University of California - Santa Barbara 2283
Sensitivity of optimized designs to problem parameters

Period	Obligations	
02/01/85-04/30/89	FY89:	TOTAL: \$140,105
Prin. Invest.	NASA Tech. Officer	CASE Category
Vanderplaats, G. N.	LARC/Sobieski, J.	41-Aero Engr

NAG 1-782 University of California - Santa Barbara 2284
A large scale experiment in Fault tolerant software

Period	Obligations	
06/18/87-03/31/90	FY89:	TOTAL: \$110,942
Prin. Invest.	NASA Tech. Officer	CASE Category
Kelly, J. P.	LARC/Eckhardt, D. E.	22-Computer Science

NAG 3-683 University of California - Santa Barbara 2285
Numerical optimization of transmissions

Period	Obligations	
01/01/86-02/27/88	FY89:	TOTAL: \$120,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Vanderplaats, G.	LERC/Coe, H. H.	46-Mech Engr

NAG 3-894 University of California - Santa Barbara 2286
Theoretical damage mechanics for metal composites

Period	Obligations	
04/01/88-03/31/90	FY89: \$30,000	TOTAL: \$105,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Leckie, F. A.	LERC/Arnold, S. M.	46-Mech Engr

NAG 5-328 University of California - Santa Barbara 2287
Research relative to angular distribution of snow reflectance

Period	Obligations	
07/01/83-10/31/87	FY89:	TOTAL: \$131,381
Prin. Invest.	NASA Tech. Officer	CASE Category
Dozier, J.	GSFC/Chang, A. T.	32-Geological Sci
	GSFC/Hall, D. K.	

NAG 5-917 University of California - Santa Barbara 2288
Correspondence of surface climate parameters with satellite and terrain data

Period	Obligations	
06/01/87-01/31/90	FY89: \$71,891	TOTAL: \$175,892
Prin. Invest.	NASA Tech. Officer	CASE Category
Dozier, J.	GSFC/Choudhury, B.	39-Env Sci, NEC
Davis, F.	GSFC/Hall, F.	

NAG 5-1010 University of California - Santa Barbara 2289
Radar forest backscatter model

Period	Obligations	
10/01/87-09/30/89	FY89:	TOTAL: \$30,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Simonett, D. S.	GSFC/Imhoff, M. L.	99-Multi-Discip

NAG 9-224 University of California - Santa Barbara 2290
Paleointensity experiments on eucrites

Period	Obligations	
05/01/87-10/01/89	FY89:	TOTAL: \$37,456
Prin. Invest.	NASA Tech. Officer	CASE Category
Cisowski, S. M.	JSC/Browne, I. D.	32-Geological Sci

NAG 9-238 University of California - Santa Barbara 2291
Experimental rheology of Martian magma and thermal evolution of Mars

Period	Obligations	
08/01/87-02/01/89	FY89:	TOTAL: \$35,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Spera, F. J.	JSC/Browne, I. D.	32-Geological Sci

NAGW 290 University of California - Santa Barbara 2292
Ship and satellite bio-optical research in the California blight

Period	Obligations	
02/01/82-09/30/89	FY89: \$258,288	TOTAL: \$1,990,382
Prin. Invest.	NASA Tech. Officer	CASE Category
Smith, R. C.	HQ-EE/Lewis, M. R.	33-Oceanography
Baker, K. S.	HQ-EE/Wilson, W. S.	

NAGW 455 University of California - Santa Barbara 2293
NASA remote sensing information sciences research group

Period	Obligations	
05/01/83-10/31/89	FY89:	TOTAL: \$1,131,870
Prin. Invest.	NASA Tech. Officer	CASE Category
Estes, J. E.	HQ-EE/Tuyahov, A. J.	39-Env Sci, NEC
Smith, T.		
Star, J. L.		

NAGW 987 University of California - Santa Barbara 2294
Browse in the EOS era

Period	Obligations	
11/01/86-05/31/90	FY89: \$123,039	TOTAL: \$496,811
Prin. Invest.	NASA Tech. Officer	CASE Category
Estes, J. E.	HQ-EC/Bredenkamp, J.	39-Env Sci, NEC
Star, J. L.	HQ-EE/Tuyahov, A. J.	

NAGW 1062 University of California - Santa Barbara 2295
Advanced radiometer development and microwave studies

Period	Obligations	
07/01/87-01/31/90	FY89: \$95,000	TOTAL: \$225,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Lubin, P. M.	HQ-EZ/Gillett, F. C.	11-Astronomy
	HQ-EZ/Weiler, E. J.	

NAGW 1137 University of California - Santa Barbara 2296
Avis measurements of snow reflectance in alpine

Period	Obligations	
08/01/87-06/30/89	FY89:	TOTAL: \$96,002
Prin. Invest.	NASA Tech. Officer	CASE Category
Dozier, J.	HQ-EE/Wickland, D. E.	39-Env Sci, NEC
	HQ-EE/Ruzek, M.	

NAGW 1246 University of California - Santa Barbara 2297
The extensional tectonics of southeastern California

Period	Obligations	
01/01/88-12/31/89	FY89: \$90,000	TOTAL: \$178,351
Prin. Invest.	NASA Tech. Officer	CASE Category
Crowell, J. C.	HQ-EE/Baltuck, M.	32-Geological Sci
	HQ-EE/Ruzek, M.	

NAGW 1265 University of California - Santa Barbara 2298
Snow radiative transfer and measurement of snow properties

Period	Obligations	
03/01/88-09/30/89	FY89: \$11,500	TOTAL: \$86,500
Prin. Invest.	NASA Tech. Officer	CASE Category
Dozier, J.	HQ-EE/Asrar, G.	39-Env Sci, NEC
Davis, R. E.	HQ-EE/Murphy, R. E.	

**NASA'S UNIVERSITY PROGRAM
CALIFORNIA (Continued)**

NAGW 1452 University of California - Santa Barbara 2299
Experimental rheology of Martian magma and thermal evolution of Mars
Period Obligations
08/01/88-07/31/90 FY89: \$69,940 TOTAL: \$69,940
Prin. Invest. NASA Tech. Officer CASE Category
Spera, F. HQ-EL/Underwood, J. R. 19-Phys Sci, NEC

NAGW 1743 University of California - Santa Barbara 2300
Remote sensing information sciences research group
Period Obligations
05/01/89-04/30/90 FY89: \$153,174 TOTAL: \$153,174
Prin. Invest. NASA Tech. Officer CASE Category
Estes, J. E. HQ-EE/Tuyahov, A. J. 99-Multi-Discip
Smith, T. R.
Star, J. L.

NAS 5-28770 University of California - Santa Barbara 2301
Thematic mapper investigations in atmospheric correction and measurement of snow radiation
Period Obligations
08/01/85-11/30/88 FY89: TOTAL: \$231,214
Prin. Invest. NASA Tech. Officer CASE Category
Dozier, J. GSFC/Oseroff, H. 39-Env Sci, NEC

NAS 5-30555 University of California - Santa Barbara 2302
Earth observing system
Period Obligations
09/25/89-12/14/90 FY89: \$45,000 TOTAL: \$45,000
Prin. Invest. NASA Tech. Officer CASE Category
Dozier, J. GSFC/Soffen, G. 54-Env Biology

NCC 2-63 University of California - Santa Barbara 2303
An investigation of the effect of surface impurities on the absorption kinetics of hydrogen chemisorbed iron
Period Obligations
04/01/80-12/31/89 FY89: \$127,731 TOTAL: \$839,814
Prin. Invest. NASA Tech. Officer CASE Category
Shanabarger, M. R. ARC/Nelson, H. G. 47-Materials Engr

NGR 05-010-062 University of California - Santa Barbara 2304
Planetary geophysics
Period Obligations
03/01/73-09/30/89 FY89: \$50,000 TOTAL: \$721,868
Prin. Invest. NASA Tech. Officer CASE Category
Peale, S. J. HQ-EL/Underwood, J. 32-Geological Sci
HQ-EL/Scott, D. H.

NGT 00-050-192 University of California - Santa Barbara 2305
NASA graduate student researchers program
Period Obligations
06/01/87-05/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Lubin, P. M. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-461 University of California - Santa Barbara 2306
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Simonetti, D. S. HQ-XE/Owens, F. C. 19-Phys Sci, NEC

NAG 5-750 University of California - Santa Cruz 2307
Viscoelastic deformation near active plate motions
Period Obligations
03/15/86-06/14/90 FY89: \$57,540 TOTAL: \$230,958
Prin. Invest. NASA Tech. Officer CASE Category
Ward, S. N. GSFC/Frey, H. V. 32-Geological Sci

NAG 9-191 University of California - Santa Cruz 2308
Isotopic constraints on early crust and mantle evolution in the Saglek Hebron area of the North Atlantic craton
Period Obligations
05/01/87-05/01/90 FY89: \$21,000 TOTAL: \$80,500
Prin. Invest. NASA Tech. Officer CASE Category
Collerson, K. D. JSC/Browne, I. D. 32-Geological Sci

NAGW 590 University of California - Santa Cruz 2309
Structure of Saturn's ring; Collision properties of water/ice particles
Period Obligations
02/01/84-10/31/89 FY89: \$30,800 TOTAL: \$216,797
Prin. Invest. NASA Tech. Officer CASE Category
Bridges, F. HQ-EL/Underwood, J. R. 32-Geological Sci
Lin, D. N. HQ-EL/Boyce, J. M.

NAGW 1102 University of California - Santa Cruz 2310
Accretion disk boundary layers
Period Obligations
06/01/87-10/31/89 FY89: TOTAL: \$61,472
Prin. Invest. NASA Tech. Officer CASE Category
Lin, D. N. HQ-EZ/Gillett, F. C. 11-Astronomy
HQ-EZ/Stachnik, R. V.

NAGW 1211 University of California - Santa Cruz 2311
The dynamics of eccentric rings around Uranus
Period Obligations
09/15/87-09/14/89 FY89: \$64,000 TOTAL: \$128,000
Prin. Invest. NASA Tech. Officer CASE Category
Lin, D. N. HQ-EL/Quaide, W. L. 19-Phys Sci, NEC
HQ-EL/Boyce, J. M.

NAGW 1273 University of California - Santa Cruz 2312
Nucleosynthesis supervalve and high energy transients
Period Obligations
01/01/88-12/31/89 FY89: \$108,914 TOTAL: \$185,725
Prin. Invest. NASA Tech. Officer CASE Category
Woosley, S. E. HQ-EZ/Clayton, G. 13-Physics
HQ-ES/Jones, W. V.

NAGW 1525 University of California - Santa Cruz 2313
Solar system occultation surveys
Period Obligations
02/01/89-01/31/90 FY89: \$20,080 TOTAL: \$20,080
Prin. Invest. NASA Tech. Officer CASE Category
Klemola, A. R. HQ-EL/Rahe, J. H. 11-Astronomy

NAGW 1577 University of California - Santa Cruz 2314
Constraints on planetary evolution from the study of volatiles at high pressure
Period Obligations
01/01/89-12/31/89 FY89: \$63,957 TOTAL: \$63,957
Prin. Invest. NASA Tech. Officer CASE Category
Williams, Q. HQ-E/Alexander, J. K. 32-Geological Sci
HQ-E/Holland, D. A.

**NASA'S UNIVERSITY PROGRAM
CALIFORNIA (Continued)**

NCA 2-152 University of California - Santa Cruz 2315
Infrared spectroscopy chemical abundance gradients in the galaxy and observing strategies for orbiting infrared telescopes

Period	Obligations	
08/12/86-08/11/88	FY89:	TOTAL: \$79,246
Prin. Invest.	NASA Tech. Officer	CASE Category
Rank, D. M.	ARC/Witteborn, F. C.	11-Astronomy
Simpson, J. P.	ARC/Erickson, E. F.	

NCA 2-200 University of California - Santa Cruz 2316
Structure and evolution of self gravitating disks around protostars

Period	Obligations	
04/01/87-03/31/89	FY89:	TOTAL: \$79,998
Prin. Invest.	NASA Tech. Officer	CASE Category
Lin, D. N.	ARC/Cassen, P. M.	11-Astronomy
Bodenheimer, P.		

NCA 2-248 University of California - Santa Cruz 2317
Perceptually lossless compression for two and three dimensional image data

Period	Obligations	
08/01/87-01/31/89	FY89: \$4,108	TOTAL: \$19,235
Prin. Invest.	NASA Tech. Officer	CASE Category
Hitchner, L. E.	ARC/Watson, A.	69-Psych, NEC

NCA 2-289 University of California - Santa Cruz 2318
Kinetic study of the template directed elongation of oligoadenylates

Period	Obligations	
01/15/88-01/14/90	FY89: \$39,867	TOTAL: \$79,687
Prin. Invest.	NASA Tech. Officer	CASE Category
Kanavarioti, A.	ARC/Chang, S.	12-Chemistry
Bernasconi, C. F.		
Crews, P. O.		

NCA 2-312 University of California - Santa Cruz 2319
Particle gas dynamics in the protoplanetary nebula

Period	Obligations	
05/01/88-06/30/89	FY89: \$7,000	TOTAL: \$47,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Lin, N. C.	ARC/Cuzzi, J. N.	11-Astronomy

NCA 2-347 University of California - Santa Cruz 2320
Dynamical models of stellar clusters and dwarf galaxies in the local group based on the proper motion data

Period	Obligations	
08/15/88-08/14/89	FY89:	TOTAL: \$20,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Lin, D. N.	ARC/Scargle, J. D.	11-Astronomy

NCA 2-348 University of California - Santa Cruz 2321
The use of the astrometric telescope facility to investigate large scale galactic structure

Period	Obligations	
08/15/88-08/14/90	FY89:	TOTAL: \$16,250
Prin. Invest.	NASA Tech. Officer	CASE Category
Nelson, H. F.	ARC/Scargle, J. D.	11-Astronomy

NCA 2-355 University of California - Santa Cruz 2322
Low light level imaging in airborne astronomy

Period	Obligations	
10/05/88-10/04/89	FY89:	TOTAL: \$40,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Rank, D. M.	ARC/Erickson, E. F.	11-Astronomy

NCA 2-399 University of California - Santa Cruz 2323
Infrared spectroscopy the design and prototyping of a 144 element spectrometer and supporting telescopic observations

Period	Obligations	
03/15/89-03/14/90	FY89: \$17,593	TOTAL: \$17,593
Prin. Invest.	NASA Tech. Officer	CASE Category
Rank, D. M.	ARC/Witteborn, F. C.	11-Astronomy

NCA 2-430 University of California - Santa Cruz 2324
Volume visualization for computational fluid dynamics

Period	Obligations	
08/01/89-07/31/91	FY89: \$14,000	TOTAL: \$14,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Wilhelms, J.	ARC/Vaziri, A.	29-Math/Computer, NEC

NCA 2-432 University of California - Santa Cruz 2325
Formation of the giant planets

Period	Obligations	
07/01/89-06/30/90	FY89: \$16,974	TOTAL: \$16,974
Prin. Invest.	NASA Tech. Officer	CASE Category
Bodenheimer, P. H.	ARC/Pollack, J. B.	11-Astronomy

NCC 2-485 University of California - Santa Cruz 2326
Preparation of the SIRT science operations center and precursor observations for SIRTE projects

Period	Obligations	
07/01/87-11/30/88	FY89:	TOTAL: \$98,785
Prin. Invest.	NASA Tech. Officer	CASE Category
Rank, D. M.	ARC/Witteborn, F. C.	11-Astronomy
	ARC/Werner, M. W.	

NCC 2-534 University of California - Santa Cruz 2327
Towards a self replicating chemical system based on cytidylic and guanic acids

Period	Obligations	
01/15/88-01/14/90	FY89: \$57,176	TOTAL: \$92,707
Prin. Invest.	NASA Tech. Officer	CASE Category
Kanavarioti, A.	ARC/Chang, S.	12-Chemistry
Bernasconi, C. F.		

NCC 2-544 University of California - Santa Cruz 2328
Theoretical and observational studies of accretion disks planet formation and the formation of star clusters and precursor science for SIRT

Period	Obligations	
07/01/88-10/31/89	FY89:	TOTAL: \$149,222
Prin. Invest.	NASA Tech. Officer	CASE Category
Lin, D. N.	ARC/Hollenbach, D. J.	11-Astronomy
	ARC/Casser, P.	

NGT 00-050-281 University of California - Santa Cruz 2329
NASA graduate student researchers program

Period	Obligations	
08/01/88-07/31/90	FY89: \$17,900	TOTAL: \$34,517
Prin. Invest.	NASA Tech. Officer	CASE Category
Lin, D. N.	HQ-XE/Owens, F. C.	11-Astronomy

NGT 00-090-014 Univ. of California 2330
National physical science consortium for graduate degrees for minorities and women

Period	Obligations	
06/01/88-05/31/89	FY89:	TOTAL: \$50,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Snow, L. N.	HQ-U/Margolis, M.	19-Phys Sci, NEC

**NASA'S UNIVERSITY PROGRAM
CALIFORNIA (Continued)**

NAG 2-322 University of The Pacific 2331
Bone cell kinetics of simulated weightlessness
Period Obligations
11/01/84-07/31/89 FY89: TOTAL: \$198,494
Prin. Invest. NASA Tech. Officer CASE Category
Roberts, W. E. ARC/Holton, E. M. 51-Biological Sci

NAG 2-505 University of The Pacific 2332
Wind tunnel pressurization and recovery systems for recovery of heavy gas freon-12 from air freon mixture in a wind tunnel application
Period Obligations
11/27/87-02/14/89 FY89: TOTAL: \$5,000
Prin. Invest. NASA Tech. Officer CASE Category
Pejack, E. R. ARC/Steinle, F. W., Jr. 46-Mech Engr
ARC/Petroff, D. N.

NAG 2-563 University of The Pacific 2333
An intelligent feedforward compensation demonstration prototype to demonstrate the feasibility of an automatic control system that has feedforward capability with learning
Period Obligations
03/15/89-11/30/89 FY89: \$10,633 TOTAL: \$10,633
Prin. Invest. NASA Tech. Officer CASE Category
O'dell, J. ARC/Steinle, F. W. 46-Mech Engr
ARC/Muhlstein, L.

NCC 2-224 University of The Pacific 2334
Bone cell activity in altered gravitational states
Period Obligations
12/01/82-08/31/89 FY89: TOTAL: \$613,308
Prin. Invest. NASA Tech. Officer CASE Category
Roberts, W. E. ARC/Holton, E. M. 51-Biological Sci

NCC 2-357 University of The Pacific 2335
Flow unsteadiness effects on boundary layers in support of rotorcraft and x-wing technology
Period Obligations
10/01/85-09/30/89 FY89: TOTAL: \$315,515
Prin. Invest. NASA Tech. Officer CASE Category
Murthy, S. V. ARC/Steinle, F. W. 41-Aero Engr

NAG 1-580 University of Redlands 2336
Wavelength control of semiconductor lasers
Period Obligations
04/01/85-07/31/88 FY89: TOTAL: \$99,990
Prin. Invest. NASA Tech. Officer CASE Category
Wang, S. LARC/Hendricks, H. D. 45-Elec Engr
LARC/Benz, H.

NAG 8-71 University of San Francisco 2337
Investigation of space radiation environment through analysis of detectors exposed on Spacelab 1 and 2
Period Obligations
07/07/86-09/22/89 FY89: TOTAL: \$180,000
Prin. Invest. NASA Tech. Officer CASE Category
Benton, E. V. MSFC/Parnell, T. A. 13-Physics
MSFC/Watts, J. W., Jr.

NAG 8-138 University of San Francisco 2338
Radiation environment of LDEF-preliminary estimate
Period Obligations
08/28/89-08/27/90 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. NASA Tech. Officer CASE Category
Benton, E. V. MSFC/Parnell, T. A. 41-Aero Engr
MSFC/Watts, J. W.

NAG 8-789 University of San Francisco 2339
Radiation environment for space station
Period Obligations
08/24/89-08/24/92 FY89: \$51,000 TOTAL: \$51,000
Prin. Invest. NASA Tech. Officer CASE Category
Benton, E. V. MSFC/Parnell, T. A. 19-Phys Sci, NEC
MSFC/Watts, J. W.

NAG 9-235 University of San Francisco 2340
High let space radiation dosimetry of astronauts
Period Obligations
06/01/87-06/01/90 FY89: \$175,000 TOTAL: \$429,000
Prin. Invest. NASA Tech. Officer CASE Category
Benton, E. V. JSC/Nachtwey, D. S. 13-Physics

NAS 9-17389 University of San Francisco 2341
Support for NASA ground-based radiological experiments
Period Obligations
01/01/85-01/01/88 FY89: TOTAL: \$211,000
Prin. Invest. NASA Tech. Officer CASE Category
Benton, E. V. JSC/Nachtwey, D. S. 51-Biological Sci

NCC 2-521 University of San Francisco 2342
Cosmos space radiation experiments
Period Obligations
02/01/88-06/30/90 FY89: \$74,976 TOTAL: \$194,976
Prin. Invest. NASA Tech. Officer CASE Category
Benton, E. V. ARC/Connolly, J. P. 13-Physics
ARC/Ballard, R. W.

NCA 2-161 Santa Clara University 2343
Controlled ecological life support system program science planning and experimentation
Period Obligations
09/01/86-08/31/89 FY89: TOTAL: \$49,985
Prin. Invest. NASA Tech. Officer CASE Category
Klein, H. P. ARC/MacElroy, R. D. 51-Biological Sci

NCA 2-213 Santa Clara University 2344
On the classification of computation algorithms and computers
Period Obligations
05/15/87-09/15/89 FY89: TOTAL: \$78,443
Prin. Invest. NASA Tech. Officer CASE Category
Alkhatib, H. ARC/Stevens, K. 22-Computer Science

NCA 2-226 Santa Clara University 2345
In vivo studies on the oxygen requirements for the sythesis of unsaturated fatty acids in cyanobacteria
Period Obligations
06/01/87-05/31/90 FY89: \$8,293 TOTAL: \$31,110
Prin. Invest. NASA Tech. Officer CASE Category
Klein, H. P. ARC/Jahnke, L. L. 51-Biological Sci

NCA 2-250 Santa Clara University 2346
The origin and evolution of nitrate reductase activity
Period Obligations
08/01/87-07/31/88 FY89: TOTAL: \$14,406
Prin. Invest. NASA Tech. Officer CASE Category
Tomlinson, G. A. ARC/Hochstein, L. I. 51-Biological Sci

NASA'S UNIVERSITY PROGRAM CALIFORNIA (Continued)

NCA 2-282 Santa Clara University 2347
 Joint development of R C tilt rotor aircraft model roll capable wind tunnel model support R C flying platform model
Period *Obligations*
 01/01/88-07/31/88 FY89: TOTAL: \$8,400
Prin. Invest. NASA Tech. Officer CASE Category
 Hight, T. K. ARC/Kutler, P. 46-Mech Engr
 ARC/Petroff, D. N.

NCA 2-380 Santa Clara University 2348
 Improve radio controlled model of a tilt rotor aircraft
Period *Obligations*
 01/01/89-07/31/89 FY89: \$9,000 TOTAL: \$9,000
Prin. Invest. NASA Tech. Officer CASE Category
 Hight, T. ARC/Kutler, P. 46-Mech Engr
 ARC/Murbach, M.

NCA 2-401 Santa Clara University 2349
 An exploratory study of the scramjet in tube concept
Period *Obligations*
 04/01/89-03/31/91 FY89: \$35,656 TOTAL: \$35,656
Prin. Invest. NASA Tech. Officer CASE Category
 Yip, T. G. ARC/Strawa, A. W. 46-Mech Engr

NCC 2-130 Santa Clara University 2350
 Interpretation of Pioneer Venus orbiter data (PVOD) with the two-dimensional ionosphere model
Period *Obligations*
 06/01/81-06/30/89 FY89: TOTAL: \$115,655
Prin. Invest. NASA Tech. Officer CASE Category
 McCormick, P. T. ARC/Whitten, R. C. 19-Phys Sci, NEC
 ARC/Mihalov, J. D.

NCC 2-406 Santa Clara University 2351
 Space physiological studies and space station laboratory development
Period *Obligations*
 03/01/86-06/30/89 FY89: \$70,426 TOTAL: \$665,985
Prin. Invest. NASA Tech. Officer CASE Category
 Fast, T. ARC/Grindeland, R. 51-Biological Sci

NCC 2-554 Santa Clara University 2352
 Performance analysis of local area networks
Period *Obligations*
 06/15/88-12/14/89 FY89: TOTAL: \$57,156
Prin. Invest. NASA Tech. Officer CASE Category
 Alkhatib, H. A. ARC/Yin, J. 22-Computer Science
 ARC/Schoch, S. K.

NCC 2-621 Santa Clara University 2353
 The turbulent project
Period *Obligations*
 06/15/89-12/31/89 FY89: \$40,110 TOTAL: \$40,110
Prin. Invest. NASA Tech. Officer CASE Category
 Alkhatib, H. S. ARC/Yin, J. 22-Computer Science

NAG 1-819 University of Southern California 2354
 Pressure measurements of impinging jet with asymmetric nozzle
Period *Obligations*
 09/14/87-09/13/89 FY89: \$62,198 TOTAL: \$126,262
Prin. Invest. NASA Tech. Officer CASE Category
 Ho, C. M. LARC/Seiner, J. M. 41-Aero Engr
 LARC/Norum, T. D.

NAG 2-146 University of Southern California 2355
 Pioneer 10/11 data analysis of the ultraviolet photometry experiment
Period *Obligations*
 10/01/81-01/31/90 FY89: \$164,308 TOTAL: \$1,226,307
Prin. Invest. NASA Tech. Officer CASE Category
 Judge, D. ARC/Lasher, L. E. 13-Physics
 ARC/Phillips, J. R.

NAG 2-532 University of Southern California 2356
 An historical study of information sciences research
Period *Obligations*
 06/01/88-12/31/89 FY89: \$99,900 TOTAL: \$278,712
Prin. Invest. NASA Tech. Officer CASE Category
 Uncapher, K. W. ARC/Friedland, P. E. 22-Computer Science

NAG 3-982 University of Southern California 2357
 Implementation of advanced coding concepts
Period *Obligations*
 01/15/89-10/14/90 FY89: \$87,500 TOTAL: \$87,500
Prin. Invest. NASA Tech. Officer CASE Category
 Welch, L. R. LERC/Budinger, J. M. 45-Elec Engr
 Peile, R. E. LERC/Harrod, J. L.

NAGW 13 University of Southern California 2358
 Observational and theoretical studies of solar p and G mode oscillations
Period *Obligations*
 01/01/80-02/28/90 FY89: \$164,000 TOTAL: \$1,280,746
Prin. Invest. NASA Tech. Officer CASE Category
 Rhodes, E. J. HQ-ES/Bohlin, J. D. 13-Physics
 HQ-ES/Kane, S.

NAGW 163 University of Southern California 2359
 A proposed study of the temporal morphology of the lo plasma utilizing the Pioneer and Voyager extreme ultraviolet data
Period *Obligations*
 04/01/81-10/31/89 FY89: \$53,527 TOTAL: \$384,315
Prin. Invest. NASA Tech. Officer CASE Category
 Judge, D. L. HQ-EL/Fox, K. 31-Atmos Sci
 Broadfoot, L. HQ-EL/Quaide, W. L.
 Kunc, J.

NAGW 317 University of Southern California 2360
 Fluorescence studies of phytoplankton pigments: A comparison of classical and laser spectroscopy
Period *Obligations*
 04/01/82-12/31/89 FY89: \$89,301 TOTAL: \$533,899
Prin. Invest. NASA Tech. Officer CASE Category
 Kiefer, D. A. HQ-EE/Lewis, M. R. 33-Oceanography
 Soohoo, J. B. HQ-EE/Wilson, W. S.

NAGW 1061 University of Southern California 2361
 Graduate research and training grant in hypersonics
Period *Obligations*
 03/15/87-03/14/90 FY89: \$199,999 TOTAL: \$599,999
Prin. Invest. NASA Tech. Officer CASE Category
 Kaplan, R. E. HQ-RF/Wander, S. M. 19-Phys Sci, NEC
 HQ-RF/Graves, R. A.

NAGW 1401 University of Southern California 2362
 Mercurie iodine X-ray detectors
Period *Obligations*
 07/01/88-09/30/89 FY89: TOTAL: \$100,810
Prin. Invest. NASA Tech. Officer CASE Category
 Iwanczyk, J. S. HQ-EL/Mahaffy, P. 32-Geological Sci

NASA'S UNIVERSITY PROGRAM **CALIFORNIA (Continued)**

NAGW 1797 University of Southern California 2363
Theoretical studies of interstellar chemistry
Period *Obligations*
07/01/89-06/30/90 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Prasad, S. S. HQ-EZ/Gillett, F. C. 11-Astronomy

NASW 4199 University of Southern California 2364
Operation of an Industrial Application Center
Period *Obligations*
07/01/86-06/30/90 FY89: \$602,766 TOTAL: \$1,575,575
Prin. Invest. *NASA Tech. Officer* *CASE Category*
King, R. HQ-Bivins, R. 99-Multi-Discip

NASW 4202 University of Southern California 2365
Continued development of uncooled mercuric iodide X ray detectors and spectrometer for space applications
Period *Obligations*
11/01/86-04/30/88 FY89: TOTAL: \$146,202
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Dabrowski, A. J. HQ-EL/Quaide, W. L. 13-Physics
HQ-EL/Gold, R.

NCA 2-254 University of Southern California 2366
Interstellar chemistry of the star forming region
Period *Obligations*
09/01/87-08/31/90 FY89: TOTAL: \$15,168
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Prasad, S. S. ARC/Hollenbach, D. J. 11-Astronomy

NCC 2-379 University of Southern California 2367
Temporal factors in mental workload
Period *Obligations*
10/01/85-09/30/89 FY89: \$68,324 TOTAL: \$191,685
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hancock, P. A. ARC/Hart, S. G. 69-Psych, NEC
ARC/Harris, R.

NCC 2-520 University of Southern California 2368
Proposed research program in information processing
Period *Obligations*
11/01/87-12/31/89 FY89: \$1,615,440 TOTAL: \$3,358,903
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Ohlander, R. B. ARC/Friedland, P. E. 22-Computer Science

NCC 2-538 University of Southern California 2369
Research on soar
Period *Obligations*
01/01/88-12/31/89 FY89: \$92,508 TOTAL: \$137,508
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Rosenbloom, P. ARC/Friedland, P. 22-Computer Science

NCC 2-539 University of Southern California 2370
Center for experimental research in parallel algorithms software and systems
Period *Obligations*
05/01/88-06/14/90 FY89: \$1,590,485 TOTAL: \$2,236,485
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Mizell, D. W. ARC/Lum, H. 22-Computer Science
ARC/McKellar, D. B.

NCC 2-587 University of Southern California 2371
Conflict detection resolution algorithms for air traffic control
Period *Obligations*
01/01/89-10/31/89 FY89: \$32,380 TOTAL: \$32,380
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Inselberg, A. ARC/Tobias, L. 22-Computer Science
ARC/Erzberger, H.

NGR 05-018-180 University of Southern California 2372
Photon-molecule interaction studies of the atmospheric gases
Period *Obligations*
08/31/72-09/30/89 FY89: \$99,474 TOTAL: \$1,130,096
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Judge, D. L. HQ-EL/Bergstrahl, J. T. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NGT 00-050-091 University of Southern California 2373
NASA graduate student researchers program
Period *Obligations*
06/01/86-05/31/88 FY89: TOTAL: \$33,430
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Kiefer, D. A. HQ-LE/Owens, F. C. 51-Biological Sci

NGT 00-050-163 University of Southern California 2374
NASA graduate student researchers program
Period *Obligations*
07/01/87-06/30/89 FY89: TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Arbib, M. HQ-XE/Owens, F. C. 46-Mech Engr

NSG 5108 University of Southern California 2375
Rocket experiments to measure the solar intensity and profile
Period *Obligations*
04/01/76-09/30/89 FY89: \$189,683 TOTAL: \$1,559,678
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Judge, D. L. GSFC/Early, L. J. 13-Physics
Ogawa, H. S. GSFC/Pless, R. H.

NSG 5422 University of Southern California 2376
A comparative study of the far ultraviolet spectra of BE stars
Period *Obligations*
10/15/79-08/31/90 FY89: \$38,900 TOTAL: \$269,040
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Peters, G. J. GSFC/West, D. 11-Astronomy
Polidan, R. S.
Percy, J. R.

COLORADO

NAG 1-554 Colorado State University 2377
Observations of upper and middle tropospheric clouds
Period *Obligations*
01/01/85-01/31/90 FY89: \$150,028 TOTAL: \$513,571
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Cox, S. K. LARC/McDougal, D. S. 31-Atmos Sci
LARC/Owens, T. L.

**NASA'S UNIVERSITY PROGRAM
COLORADO (Continued)**

NAG 1-865 Colorado State University 2378
Scientific analysis of satellite Earth radiation budget measurements related to atmospheric circulation and climate
Period Obligations
03/18/88-03/17/90 FY89: \$125,000 TOTAL: \$250,000
Prin. Invest. NASA Tech. Officer CASE Category
Haar, T. H. LARC/Smith, G. L. 31-Atmos Sci

NAG 1-893 Colorado State University 2379
Numerical simulation of closed cellular cloud patterns in marine subtropical stratocumulus layers
Period Obligations
07/01/88-12/31/89 FY89: \$50,000 TOTAL: \$67,381
Prin. Invest. NASA Tech. Officer CASE Category
Randall, D. A. LARC/Owens, T. L. 31-Atmos Sci
LARC/McDougal, D. S.

NAG 1-909 Colorado State University 2380
Control implementation tools for multi-flexible body test methods
Period Obligations
10/01/88-06/30/90 FY89: \$99,909 TOTAL: \$99,909
Prin. Invest. NASA Tech. Officer CASE Category
Brubaker, T. P. LARC/Williams, J. P. 47-Materials Engr
LARC/Juang, J. N.

NAG 1-1025 Colorado State University 2381
Data use investigations and science support for the Earth radiation budget experiment
Period Obligations
07/17/89-05/16/90 FY89: \$42,000 TOTAL: \$42,000
Prin. Invest. NASA Tech. Officer CASE Category
Vonder Haar, T. H. LARC/Keynton, R. J. 31-Atmos Sci
Campbell, G. G. LARC/Harrison, E. F.
Stephens, G.

NAG 2-577 Colorado State University 2382
Multi boundary iterative methods for the Navier-Stokes equations
Period Obligations
06/01/89-05/31/90 FY89: \$43,299 TOTAL: \$43,299
Prin. Invest. NASA Tech. Officer CASE Category
Prenter, P. M. ARC/Erickson, L. L. 41-Aero Engr
Cooper, K. D.

NAG 3-633 Colorado State University 2383
Development and in-site characterization of dielectric layers for use with compound semiconductors
Period Obligations
04/01/85-11/29/88 FY89: TOTAL: \$245,000
Prin. Invest. NASA Tech. Officer CASE Category
Lile, D. L. LERC/Pouch, J. J. 13-Physics

NAG 3-776 Colorado State University 2384
Space plasma contactor research
Period Obligations
01/31/87-12/29/89 FY89: \$100,372 TOTAL: \$250,797
Prin. Invest. NASA Tech. Officer CASE Category
Wilbur, P. J. LERC/Kolecki, J. C. 42-Astro Engr
Caron, J. E. LERC/Purvis, C. K.

NAG 3-791 Colorado State University 2385
Low Earth orbital atomic oxygen simulation research
Period Obligations
04/01/87-09/30/88 FY89: TOTAL: \$29,998
Prin. Invest. NASA Tech. Officer CASE Category
Wilbur, P. J. LERC/Rutledge, S. K. 13-Physics

NAG 5-359 Colorado State University 2386
Sea breeze induced mesoscale systems and severe weather
Period Obligations
08/01/83-12/31/89 FY89: \$100,000 TOTAL: \$488,652
Prin. Invest. NASA Tech. Officer CASE Category
Pielke, R. A. GSFC/Koch, S. E. 31-Atmos Sci
Segal, M. GSFC/Uccellini, L. W.

NAG 5-910 Colorado State University 2387
Surface biophysical properties and trace gas exchange in tall grass
Period Obligations
06/15/87-01/31/90 FY89: \$140,000 TOTAL: \$339,296
Prin. Invest. NASA Tech. Officer CASE Category
Schimel, D. S. GSFC/Levine, E. R. 39-Env Sci, NEC
Parton, W. J. GSFC/Hall, F.
Woodmansee, R. G.

NAG 5-1058 Colorado State University 2388
Hydrological cloud studies
Period Obligations
07/15/88-02/28/90 FY89: \$123,587 TOTAL: \$165,806
Prin. Invest. NASA Tech. Officer CASE Category
Randall, D. GSFC/King, M. D. 31-Atmos Sci

NAG 5-1122 Colorado State University 2389
A modeling study of linear and nonlinear aspects of the tropical 30-60 day oscillation
Period Obligations
03/01/89-02/28/90 FY89: \$55,501 TOTAL: \$55,501
Prin. Invest. NASA Tech. Officer CASE Category
Stevens, D. E. GSFC/Lau, W. K. 31-Atmos Sci
Stephens, G.

NAG 8-643 Colorado State University 2390
Microwave radiative transfer studies in convective storms during space
Period Obligations
07/01/87-06/30/89 FY89: TOTAL: \$186,944
Prin. Invest. NASA Tech. Officer CASE Category
Bringe, V. N. MSFC/Spencer, R. W. 31-Atmos Sci
Stephens, G. MSFC/Hood, R.

NAG 9-10 Colorado State University 2391
Life spans of skin fibroblasts from irradiated primates
Period Obligations
06/16/80-12/01/89 FY89: TOTAL: \$491,000
Prin. Invest. NASA Tech. Officer CASE Category
Lett, J. JSC/Nachtwey, D. S. 54-Env Biology
Cox, A. B.
Lee, A. C.

NAG 9-120 Colorado State University 2392
Hollow cathode plasma coupling study
Period Obligations
08/01/85-11/01/88 FY89: TOTAL: \$90,096
Prin. Invest. NASA Tech. Officer CASE Category
Wilbur, P. J. JSC/McCoy, J. E. 46-Mech Engr

NAGW 535 Colorado State University 2393
Channel patterns on Mars
Period Obligations
03/01/84-12/31/88 FY89: TOTAL: \$107,711
Prin. Invest. NASA Tech. Officer CASE Category
Schumm, S. A. HQ-EL/Scott, D. H. 32-Geological Sci
HQ-EL/Boyce, J. M.

NASA'S UNIVERSITY PROGRAM

COLORADO (Continued)

NAS 1-16465 Colorado State University 2394
 Scientific investigations for the Earth radiation budget experiment (ERBE)
Period *Obligations*
 09/30/80-02/28/88 FY89: TOTAL: \$332,146
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Vonderhaar, T. H. LARC/Hall, J. B. 31-Atmos Sci
 LARC/Barkstrom, B. R.

NAS 5-33007 Colorado State University 2395
 EOS interdisciplinary study
Period *Obligations*
 09/11/89-12/14/90 FY89: \$45,000 TOTAL: \$45,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Schimel, D. S. GSFC/Soffen, G. 54-Env Biology

NAS 8-36354 Colorado State University 2396
 Measurement of terms and parameters in turbulent models
Period *Obligations*
 08/13/85-09/30/89 FY89: TOTAL: \$471,297
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Sandborn, V. A. MSFC/Campbell, W. 46-Mech Engr
 MSFC/Heaman, J.

NAS 9-17168 Colorado State University 2397
 Services of SL-4 payload specialist
Period *Obligations*
 01/20/84-07/01/90 FY89: \$139,272 TOTAL: \$634,717
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Phillips, R. W. JSC/Womack, W. 49-Engr, NEC

NGR 06-002-112 Colorado State University 2398
 An experimental investigation of hollow cathode discharge start-up and operation
Period *Obligations*
 12/21/70-10/25/89 FY89: \$85,364 TOTAL: \$1,399,598
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Wilbur, P. J. LERC/Rawlin, V. K. 46-Mech Engr

NGT 00-050-094 Colorado State University 2399
 NASA graduate student researchers program
Period *Obligations*
 06/01/86-05/31/89 FY89: TOTAL: \$53,792
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Omi, P. N. HQ-LE/Owens, F. C. 71-Anthropology

NGT 00-050-370 Colorado State University 2400
 NASA graduate student researchers program
Period *Obligations*
 08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Wilbur, P. J. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 00-070-153 Colorado State University 2401
 Minority graduate student researchers program
Period *Obligations*
 08/14/89-08/13/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Pielke, R. A. HQ-XE/Owens, F. C. 31-Atmos Sci

NGT 06-002-802 Colorado State University 2402
 NASA graduate student training program
Period *Obligations*
 11/01/84-09/30/89 FY89: \$95,000 TOTAL: \$469,929
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Burns, P. J. HQ-LE/Graves, R. A. 22-Computer Science
 Zachmann, D. HQ-RF/Wander, S. M.

NAG 1-640 University of Colorado - Boulder 2403
 Parallel software support for computational structural mechanics
Period *Obligations*
 06/01/86-05/31/90 FY89: TOTAL: \$114,257
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Jordan, H. LARC/Storaasli, O. O. 29-Math/Computer, NEC
 LARC/Bostic, S. W.

NAG 1-651 University of Colorado - Boulder 2404
 Investigations of the climatology and mechanics of the California stratocumulus cloud deck
Period *Obligations*
 03/01/86-02/28/90 FY89: \$50,000 TOTAL: \$152,408
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Hanson, H. P. LARC/McDougal, D. S. 31-Atmos Sci
 LARC/Owens, T. L.

NAG 1-756 University of Colorado - Boulder 2405
 Computational methods and software systems for dynamics and control of large space structures
Period *Obligations*
 04/13/87-06/15/90 FY89: \$123,000 TOTAL: \$472,195
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Park, K. C. LARC/Giles, G. L. 46-Mech Engr
 Felippa, C. A. LARC/Stroud, W. J.

NAG 1-769 University of Colorado - Boulder 2406
 Experimental exploration and control of wave trail induced in the flat plate boundary layer
Period *Obligations*
 05/26/87-09/25/88 FY89: TOTAL: \$20,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Freymuth, P. LARC/Maestrello, L. 41-Aero Engr
 Biringen, S.

NAG 1-798 University of Colorado - Boulder 2407
 The numerical simulation of transitional flows
Period *Obligations*
 08/13/87-06/30/90 FY89: \$24,500 TOTAL: \$79,500
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Biringen, S. LARC/Harvey, W. D. 41-Aero Engr
 LARC/Dagenhart, J. R.

NAG 1-880 University of Colorado - Boulder 2408
 A contribution to hypersonic design aerodynamics
Period *Obligations*
 05/01/88-04/30/90 FY89: \$47,983 TOTAL: \$69,807
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Sobieczky, H. LARC/Bauer, S. X. 41-Aero Engr
 Seebass, A. R. LARC/Wood, R. M.

NAG 1-998 University of Colorado - Boulder 2409
 Global surface based cloud observations for ISCCP
Period *Obligations*
 04/18/89-04/17/90 FY89: \$59,422 TOTAL: \$59,422
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 London, J. LARC/McDougal, D. M. 31-Atmos Sci
 Warren, S. G. LARC/Owens, T. L.

**NASA'S UNIVERSITY PROGRAM
COLORADO (Continued)**

NAG 1-1021 University of Colorado - Boulder 2410
Analysis preliminary design and simulation systems for control structure interaction problems

Period	Obligations	
10/01/89-09/30/90	FY89: \$101,974	TOTAL: \$101,974
Prin. Invest.	NASA Tech. Officer	CASE Category
Park, K. C.	LARC/Armstrong, E. S.	49-Engr, NEC
Felippa, C.		
Farhat, C.		

NAG 2-504 University of Colorado - Boulder 2411
Pioneer Venus orbiter ultraviolet spectrometer operations and data analysis

Period	Obligations	
10/01/87-10/31/89	FY89: \$180,000	TOTAL: \$400,465
Prin. Invest.	NASA Tech. Officer	CASE Category
Stewart, A. I.	ARC/Lasher, L. E.	11-Astronomy
	ARC/Craig, R. A.	

NAG 2-517 University of Colorado - Boulder 2412
Correlative studies of ground based microwave and Pioneer Venus radio occultation measurements of Venus atmospheric temperatures

Period	Obligations	
07/01/88-06/30/90	FY89: \$14,000	TOTAL: \$23,880
Prin. Invest.	NASA Tech. Officer	CASE Category
Clancy, R. T.	ARC/Lasher, L. E.	11-Astronomy
	ARC/Fimmel, R. O.	

NAG 3-934 University of Colorado - Boulder 2413
Coupled structural thermal phase change and electromagnetic analysis for super conductors

Period	Obligations	
09/21/88-12/20/89	FY89:	TOTAL: \$75,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Felippa, C. A.	LERC/Chamis, C. C.	41-Aero Engr
Park, K. C.	LERC/Melis, M. E.	

NAG 3-993 University of Colorado - Boulder 2414
Modeling of coalescence agglomeration and phase segregation in microgravity processing a bimetallic composite materials

Period	Obligations	
02/01/89-01/31/90	FY89: \$42,066	TOTAL: \$42,066
Prin. Invest.	NASA Tech. Officer	CASE Category
Davis, R. H.	LERC/Salzman, J. A.	43-Chem Engr

NAG 3-994 University of Colorado - Boulder 2415
Effect of gravity modulation in cylindrical containers in the microgravity environment

Period	Obligations	
02/01/89-06/30/90	FY89: \$7,898	TOTAL: \$7,898
Prin. Invest.	NASA Tech. Officer	CASE Category
Biringer, S.	LERC/Chait, A.	47-Materials Engr
	LERC/Glasgow, T. K.	

NAG 3-1018 University of Colorado - Boulder 2416
Thermal acoustic oscillations in slush hydrogen

Period	Obligations	
03/15/89-03/14/90	FY89: \$49,514	TOTAL: \$49,514
Prin. Invest.	NASA Tech. Officer	CASE Category
Timmerhaus, K.	LERC/Dewitt, R.	43-Chem Engr
Gu, Y.	LERC/Hardy, T.	

NAG 5-78 University of Colorado - Boulder 2417
Spectroscopic observations of selected stellar systems

Period	Obligations	
07/01/80-08/31/90	FY89: \$36,500	TOTAL: \$466,760
Prin. Invest.	NASA Tech. Officer	CASE Category
Garmany, K.	GSFC/West, D.	11-Astronomy
Henrichs, H. F.		
Massey, P.		

NAG 5-82 University of Colorado - Boulder 2418
International Ultraviolet Explorer (IUE) studies of cool stars

Period	Obligations	
07/01/80-10/31/89	FY89: \$34,435	TOTAL: \$690,451
Prin. Invest.	NASA Tech. Officer	CASE Category
Linsky, J. L.	GSFC/Kondo, Y.	11-Astronomy
Neff, J. E.		
Bookbinder, J.		

NAG 5-96 University of Colorado - Boulder 2419
Study of reflection grating spectrometers for X-ray astronomy

Period	Obligations	
09/01/80-03/31/90	FY89: \$479,072	TOTAL: \$1,967,128
Prin. Invest.	NASA Tech. Officer	CASE Category
Cash, W. C.	GSFC/Early, L. J.	11-Astronomy
	GSFC/Pless, R. H.	

NAG 5-193 University of Colorado - Boulder 2420
Spectroscopic studies of interstellar matter and stellar mass loss

Period	Obligations	
07/01/81-09/30/90	FY89: \$17,000	TOTAL: \$436,524
Prin. Invest.	NASA Tech. Officer	CASE Category
Shull, J. M.	GSFC/West, D.	11-Astronomy
Voit, G. M.		

NAG 5-199 University of Colorado - Boulder 2421
International Ultraviolet Experiment studies

Period	Obligations	
07/15/81-09/30/90	FY89: \$20,000	TOTAL: \$452,100
Prin. Invest.	NASA Tech. Officer	CASE Category
Ayres, T. R.	GSFC/West, D.	11-Astronomy
Hawley, S. L.		
Brown, A.		

NAG 5-350 University of Colorado - Boulder 2422
Analysis of selected symbiotic stars

Period	Obligations	
08/01/83-10/31/89	FY89: \$8,750	TOTAL: \$151,926
Prin. Invest.	NASA Tech. Officer	CASE Category
Brugal, E. W.	GSFC/Kondo, Y.	11-Astronomy
Willson, L. A.		

NAG 5-412 University of Colorado - Boulder 2423
The study of extreme ultraviolet observatory designs

Period	Obligations	
04/01/84-06/30/90	FY89: \$43,461	TOTAL: \$180,192
Prin. Invest.	NASA Tech. Officer	CASE Category
Cash, W. C.	GSFC/Osantowski, J. F.	11-Astronomy
Walter, F.		
Snow, T. P.		

**NASA'S UNIVERSITY PROGRAM
COLORADO (Continued)**

NAG 5-429 University of Colorado - Boulder 2424
Investigation of variable star asymmetries
Period *Obligations*
07/01/84-09/30/89 FY89: TOTAL: \$169,391
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Walter, F. M. GSFC/Kondo, Y. 11-Astronomy
Brown, A.
Ayres, T. R.

NAG 5-433 University of Colorado - Boulder 2425
Ultraviolet spectra of astronomical sources
Period *Obligations*
08/01/84-06/30/90 FY89: \$12,901 TOTAL: \$140,201
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Fesen, R. A. GSFC/West, D. K. 11-Astronomy
Hamilton, A. J.
Leventhal, M.

NAG 5-485 University of Colorado - Boulder 2426
Studies of polar motion, Earth rotation and plate motion
Period *Obligations*
12/20/84-02/28/90 FY89: \$76,575 TOTAL: \$361,682
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wahr, J. GSFC/Frey, H. V. 32-Geological Sci

NAG 5-633 University of Colorado - Boulder 2427
Lasp coronal EUV spectrometer
Period *Obligations*
01/01/86-11/30/89 FY89: \$369,638 TOTAL: \$1,430,561
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Rottman, G. J. GSFC/Early, L. J. 13-Physics
GSFC/Pless, R. H.

NAG 5-652 University of Colorado - Boulder 2428
EUV solar irradiance experiment
Period *Obligations*
12/01/88-11/30/89 FY89: \$145,844 TOTAL: \$145,844
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Woods, T. N. GSFC/Early, L. J. 13-Physics
GSFC/Pless, R. H.

NAG 5-760 University of Colorado - Boulder 2429
The effects of geographical correlation on station locations and baseline determination
Period *Obligations*
10/01/88-04/14/90 FY89: \$29,042 TOTAL: \$124,363
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Rosborough, G. W. GSFC/Frey, H. V. 32-Geological Sci

NAG 5-797 University of Colorado - Boulder 2430
The winds of high luminosity late type bright stars and supergrants
Period *Obligations*
06/15/86-06/14/89 FY89: TOTAL: \$38,900
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Carpenter, K. G. GSFC/Kondo, Y. 11-Astronomy
Brown, A.
Linsky, J.

NAG 5-809 University of Colorado - Boulder 2431
Ultraviolet observations of anomalous X ray selected stars
Period *Obligations*
07/15/86-09/14/90 FY89: \$10,643 TOTAL: \$41,497
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Stocke, J. T. GSFC/West, D. K. 11-Astronomy
Malkan, M.
Polidan, R.

NAG 5-816 University of Colorado - Boulder 2432
Fundamental propective of the eg andromedae system derived from high dispersion spectra at opposite quadrants
Period *Obligations*
07/15/86-08/14/90 FY89: TOTAL: \$48,143
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Stencel, R. E. GSFC/Kondo, Y. 11-Astronomy
Pesce, J. E.
Dachs, J.

NAG 5-817 University of Colorado - Boulder 2433
The influence of the solar wind on outer planet aurorae
Period *Obligations*
07/15/86-08/14/90 FY89: TOTAL: \$82,951
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Skinner, T. E. GSFC/Kondo, Y. 11-Astronomy

NAG 5-833 University of Colorado - Boulder 2434
Spectrophotometry of selected emission line stars in the large Magellanic cloud
Period *Obligations*
08/15/86-09/14/90 FY89: TOTAL: \$39,305
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bohannon, B. GSFC/Kondo, Y. 11-Astronomy

NAG 5-882 University of Colorado - Boulder 2435
Algorithm validation of sea ice concentration multigor ice traction and ice edge location
Period *Obligations*
07/01/87-04/30/90 FY89: \$101,173 TOTAL: \$221,445
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Steffen, K. GSFC/Cavalieri, D. J. 33-Oceanography
Weaver, R. L.

NAG 5-898 University of Colorado - Boulder 2436
Cloud cover determination in polar regions from satellite data
Period *Obligations*
05/01/87-12/31/89 FY89: TOTAL: \$171,409
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Barry, R. G. GSFC/Cahalan, R. F. 31-Atmos Sci

NAG 5-904 University of Colorado - Boulder 2437
Aircraft investigation of boundary layer structure and turbulence during fite
Period *Obligations*
05/01/87-01/31/90 FY89: \$59,000 TOTAL: \$235,365
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Grossman, R. L. GSFC/Wetzel, P. J. 39-Env Sci, NEC
GSFC/Hall, F.

NAG 5-930 University of Colorado - Boulder 2438
Special sensor microwave imager validation using NOAA data
Period *Obligations*
06/14/87-01/14/89 FY89: \$4,893 TOTAL: \$83,175
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Emery, W. J. GSFC/Cavalieri, D. J. 33-Oceanography

NAG 5-948 University of Colorado - Boulder 2439
Simultaneous ultraviolet extreme ultraviolet observations of an active cool star and hot white dwarf
Period *Obligations*
07/15/87-01/14/89 FY89: TOTAL: \$9,859
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Cash, W. C. GSFC/Kondo, Y. 11-Astronomy
Walter, F. M.
Ayres, T. R.

NASA'S UNIVERSITY PROGRAM **COLORADO (Continued)**

NAG 5-960 University of Colorado - Boulder 2440
Participation in astromag studies
Period *Obligations*
08/01/87-03/31/90 FY89: TOTAL: \$5,377
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Jordan, S. GSFC/Ormes, J. A. 13-Physics

NAG 5-1137 University of Colorado - Boulder 2448
Relationships between globally derived plate slip vectors and the morphology of transform boundaries
Period *Obligations*
06/01/89-05/31/90 FY89: \$51,909 TOTAL: \$51,909
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bilham, R. GSFC/Welker, J. E. 32-Geological Sci

NAG 5-963 University of Colorado - Boulder 2441
Low dispersion observations of bright stars
Period *Obligations*
12/01/87-11/30/89 FY89: TOTAL: \$18,400
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Garmany, C. D. GSFC/Kondo, Y. 11-Astronomy
Bless, R. C.
Pitts, R. E.

NAG 5-1145 University of Colorado - Boulder 2449
Cycle dependent studies of semi regular giant stars
Period *Obligations*
06/15/89-06/14/90 FY89: \$28,801 TOTAL: \$28,801
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Judge, P. G. GSFC/West, D. K. 11-Astronomy

NAG 5-985 University of Colorado - Boulder 2442
Ultraviolet observations of selected astronomical sources
Period *Obligations*
09/01/87-08/31/90 FY89: TOTAL: \$135,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Brown, A. GSFC/Kondo, Y. 11-Astronomy

NAG 5-1151 University of Colorado - Boulder 2450
Ultraviolet observations of Pluto's surface Uranian satellites Triton and Neptune
Period *Obligations*
06/15/89-06/14/90 FY89: \$43,700 TOTAL: \$43,700
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Stern, S. A. GSFC/West, D. K. 11-Astronomy

NAG 5-1000 University of Colorado - Boulder 2443
Pulse phase spectroscopy of a selected massive X ray benoig
Period *Obligations*
09/15/87-09/14/88 FY89: TOTAL: \$15,600
Prin. Invest. *NASA Tech. Officer* *CASE Category*
McCray, R. GSFC/Kondo, Y. 11-Astronomy
Kallman, T.
Voit, M.

NAG 5-1214 University of Colorado - Boulder 2451
The search for new red supergiants in the Northern milky way and analysis of the entire LRS dataset
Period *Obligations*
08/15/89-08/14/90 FY89: \$45,500 TOTAL: \$45,500
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Stencel, R. E. GSFC/West, D. 11-Astronomy

NAG 5-1016 University of Colorado - Boulder 2444
Wolf-Rayet stars in the Magellanic clouds
Period *Obligations*
10/15/87-10/14/90 FY89: \$34,100 TOTAL: \$81,706
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Conti, P. S. GSFC/West, D. 11-Astronomy
Garmany, C. D.

NAG 5-1215 University of Colorado - Boulder 2452
Astrophysical data programs
Period *Obligations*
08/15/89-08/14/90 FY89: \$125,400 TOTAL: \$125,400
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Ayres, T. R. GSFC/West, D. 11-Astronomy

NAG 5-1089 University of Colorado - Boulder 2445
Ultraviolet spectra Seyfert galaxies data analysis GEX enhancement
Period *Obligations*
10/01/88-03/31/90 FY89: TOTAL: \$25,695
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Edelson, R. GSFC/Kondo, Y. 11-Astronomy

NAG 5-1216 University of Colorado - Boulder 2453
Wolf-Rayet exhibiting strong stellar winds
Period *Obligations*
08/15/89-08/14/90 FY89: \$33,501 TOTAL: \$33,501
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Garmany, C. D. GSFC/West, D. 11-Astronomy

NAG 5-1104 University of Colorado - Boulder 2446
An imaging detector for plasma spectrometers
Period *Obligations*
10/15/88-10/14/89 FY89: \$127,850 TOTAL: \$127,850
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lawrence, G. M. GSFC/Ogilvie, K. W. 13-Physics
GSFC/Herrero, F.

NAG 5-1217 University of Colorado - Boulder 2454
X ray analyses of X ray discovered low mass pre-main sequence stars
Period *Obligations*
08/15/89-02/14/90 FY89: \$6,000 TOTAL: \$6,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Walter, F. M. GSFC/West, D. 11-Astronomy

NAG 5-1115 University of Colorado - Boulder 2447
Gravity waves initiated by consecvively active
Period *Obligations*
01/01/89-12/31/89 FY89: \$31,939 TOTAL: \$31,939
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Grossman, R. L. GSFC/Melfi, S. H. 31-Atmos Sci

NAG 5-1224 University of Colorado - Boulder 2455
Astrophysical data program research
Period *Obligations*
08/15/89-02/14/90 FY89: \$58,440 TOTAL: \$58,440
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Shull, J. M. GSFC/West, D. 11-Astronomy
Stocke, J. T.
Edelson, R. A.

NASA'S UNIVERSITY PROGRAM **COLORADO (Continued)**

NAG 5-1242 University of Colorado - Boulder 2456
Discovery of infrared bright/radio quiet galactic supernova remnants
Period *Obligations*
08/01/89-08/31/89 FY89: \$41,000 TOTAL: \$41,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Fesen, R. A. GSFC/West, D. 11-Astronomy

NAG 8-508 University of Colorado - Boulder 2457
Low mass pre-main sequence stars near dark clouds
Period *Obligations*
01/01/85-12/31/88 FY89: TOTAL: \$53,242
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Walter, F. M. MSFC/Harper, B. 11-Astronomy

NAG 8-575 University of Colorado - Boulder 2458
Optical identifications for a complete sample of faint X ray sources the expanded Einstein medium sensitivity survey
Period *Obligations*
04/01/86-12/31/88 FY89: TOTAL: \$34,044
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Stoeke, J. T. MSFC/Harper, B. 11-Astronomy
Morris, S.

NAG 8-651 University of Colorado - Boulder 2459
X ray ultraviolet spectra of the CFA Seyfert galaxies
Period *Obligations*
07/01/87-06/30/89 FY89: TOTAL: \$52,766
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Edelson, R. A. MSFC/Harper, B. 11-Astronomy

NAG 8-658 University of Colorado - Boulder 2460
A HEAD EXOSAT archive study of X ray selected B 1 lacerta objects
Period *Obligations*
09/01/87-08/31/89 FY89: TOTAL: \$20,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Stoeke, J. T. MSFC/Harper, B. A. 11-Astronomy

NAG 8-744 University of Colorado - Boulder 2461
Study of coronal temperatures of cool stars
Period *Obligations*
08/01/88-07/31/89 FY89: TOTAL: \$26,543
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Linsky, J. L. MSFC/Harper, B. A. 11-Astronomy

NAG 8-745 University of Colorado - Boulder 2462
X ray analyses of X ray discovered low mass pre main sequence stars
Period *Obligations*
08/01/88-07/31/90 FY89: \$66,051 TOTAL: \$129,102
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Walter, F. M. MSFC/Havrisik, D. M. 11-Astronomy

NAG 8-787 University of Colorado - Boulder 2463
Planetary circulations in the presence of transient and self-induced heating
Period *Obligations*
05/31/89-07/20/90 FY89: \$95,000 TOTAL: \$95,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Salby, M. L. MSFC/Kaufman, J. W. 31-Atmos Sci
Garcia, R. R. MSFC/Robertson, F. R.

NAGW 91 University of Colorado - Boulder 2464
Turbulence and wave-particle interactions in solar-terrestrial plasmas
Period *Obligations*
07/01/80-09/30/89 FY89: \$245,000 TOTAL: \$2,218,500
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Dulk, G. A. HQ-ES/Mellott, M. M. 11-Astronomy
Toomre, J. GSFC/Curtis, S. A.
Goldman, M. V.

NAGW 197 University of Colorado - Boulder 2465
Theoretical research programs in physics at planetary atmospheres, radiative transfer theory and data interpretation
Period *Obligations*
07/01/81-11/30/89 FY89: TOTAL: \$314,633
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hord, C. W. HQ-EL/Fox, K. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NAGW 389 University of Colorado - Boulder 2466
Theoretical research in physics of planetary atmospheres; Global studies of atmospheric constituents and dynamics
Period *Obligations*
11/01/82-09/30/89 FY89: TOTAL: \$549,258
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Esposito, L. HQ-EL/Fox, K. 31-Atmos Sci
Stewart, I. HQ-EL/Quaide, W. L.

NAGW 552 University of Colorado - Boulder 2467
Behaviour of water on Mars
Period *Obligations*
04/01/84-10/31/89 FY89: \$55,100 TOTAL: \$263,728
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Jakosky, B. M. HQ-EL/Bergstralh, J. T. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NAGW 641 University of Colorado - Boulder 2468
Cryospheric data management system for DMSP SSM/I data management
Period *Obligations*
06/01/84-09/30/89 FY89: \$341,940 TOTAL: \$1,669,983
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Barry, R. G. HQ-EE/Thomas, R. H. 33-Oceanography
HQ-EE/Wilson, W. S.

NAGW 766 University of Colorado - Boulder 2469
Theory of spectra formation in astrophysical systems
Period *Obligations*
07/05/85-11/30/89 FY89: \$200,000 TOTAL: \$1,167,425
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Schull, J. M. HQ-EZ/Clayton, G. C. 11-Astronomy
HQ-EZ/Bunner, A. N.

NAGW 769 University of Colorado - Boulder 2470
Studies of the dynamics of outer planet rings
Period *Obligations*
07/01/85-09/30/89 FY89: \$31,200 TOTAL: \$150,134
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Esposito, L. W. HQ-EL/Underwood, J. R. 32-Geological Sci
HQ-EL/Boyce, J. M.

NAGW 771 University of Colorado - Boulder 2471
Remote sensing analysis of Mars
Period *Obligations*
06/01/85-10/31/89 FY89: \$20,800 TOTAL: \$90,638
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Jakosky, B. HQ-EL/Underwood, J. R. 32-Geological Sci
HQ-EL/Boyce, J. M.

NASA'S UNIVERSITY PROGRAM **COLORADO (Continued)**

NAGW 772 University of Colorado - Boulder 2472
Investigation of irreversible material exchange induced by planetary waves
Period *Obligations*
06/01/85-11/30/89 FY89: \$115,000 TOTAL: \$1,059,833
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Salby, M. L. HQ-EE/McPeters, R. D. 31-Atmos Sci
HQ-EE/Prather, M. J.

NAGW 822 University of Colorado - Boulder 2473
Laser gravitational observation in space
Period *Obligations*
12/01/85-11/30/88 FY89: TOTAL: \$245,883
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bender, P. L. HQ-E/Alexander, J. K. 13-Physics
HQ-EP/Konkel, R. M.

NAGW 890 University of Colorado - Boulder 2474
Analysis of SME airglows and odd oxygen in the upper mesosphere and lower thermosphere
Period *Obligations*
04/01/86-09/30/89 FY89: TOTAL: \$197,634
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Thomas, R. J. HQ-EE/Jackman, C. H. 31-Atmos Sci
HQ-EE/Butler, D. M.

NAGW 904 University of Colorado - Boulder 2475
Thermospheric and mesospheric nitric oxide during high solar activity
Period *Obligations*
07/01/86-02/28/89 FY89: TOTAL: \$195,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Rusch, D. W. HQ-EE/Miller, T. L. 31-Atmos Sci
HQ-EE/Prather, M. J.

NAGW 934 University of Colorado - Boulder 2476
Fine scale turbulence structure
Period *Obligations*
07/01/86-12/31/89 FY89: TOTAL: \$200,169
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Grossman, R. L. HQ-EE/McPeters, R. D. 31-Atmos Sci
HQ-EE/Prather, M. J.

NAGW 951 University of Colorado - Boulder 2477
Center for low gravity fluid mechanics and transport phenomena
Period *Obligations*
09/01/86-09/30/89 FY89: TOTAL: \$1,200,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Kassoy, D. R. HQ-EN/Naumann, R. J. 19-Phys Sci, NEC
Morgenthaler, G. HQ-EN/Crouch, R. K.

NAGW 998 University of Colorado - Boulder 2478
Wave generation and particle transport in the plasma sheet and the particle layer
Period *Obligations*
10/01/86-09/30/89 FY89: TOTAL: \$122,032
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Dusenber, P. B. HQ-EE/Theis, R. F. 13-Physics
Speiser, T. HQ-EE/Eastman, T. E.

NAGW 1002 University of Colorado - Boulder 2479
Global surface based cloud observations for ISCCP
Period *Obligations*
01/01/87-12/31/89 FY89: TOTAL: \$108,075
Prin. Invest. *NASA Tech. Officer* *CASE Category*
London, J. HQ-EE/Schiffer, R. A. 31-Atmos Sci
Warren, S. HQ-EE/Theon, J. S.

NAGW 1054 University of Colorado - Boulder 2480
Studies of magnetopause structure
Period *Obligations*
03/15/87-07/31/89 FY89: TOTAL: \$82,418
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Speiser, T. HQ-ES/Mellott, M. M. 13-Physics
HQ-EE/Eastman, T. E.

NAGW 1095 University of Colorado - Boulder 2481
Low cost end to end data system research
Period *Obligations*
06/01/87-12/30/89 FY89: \$437,665 TOTAL: \$538,665
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hansen, E. R. HQ-EC/Bredekamp, J. 29-Math/Computer, NEC
Davis, R. L.

NAGW 1105 University of Colorado - Boulder 2482
Research on telecommunications policy trends and technology
Period *Obligations*
06/01/87-06/30/90 FY89: \$179,380 TOTAL: \$472,368
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Byerly, R. HQ-EC/Kierier, J. W. 99-Multi-Discip
Barnes, F. S.
June, D.

NAGW 1110 University of Colorado - Boulder 2483
Algorithm validation for the along track scanning radio meter participation in the cooperative program with German scientists
Period *Obligations*
06/01/87-05/31/90 FY89: \$47,478 TOTAL: \$132,316
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Emery, W. J. HQ-EE/Lagerloef, G. S. 33-Oceanography
HQ-EE/Wilson, W. S.

NAGW 1121 University of Colorado - Boulder 2484
Science and applications information systems studies
Period *Obligations*
06/01/87-12/31/89 FY89: TOTAL: \$325,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hansen, E. R. HQ-EC/Schmerling, E. 22-Computer Science
Davis, R. L. HQ-EC/Bredekamp, J.
Ludwig, G. H.

NAGW 1124 University of Colorado - Boulder 2485
Altimetry data assimilation and numerical ocean modeling
Period *Obligations*
07/01/87-10/31/89 FY89: \$87,502 TOTAL: \$362,848
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Born, G. HQ-EE/Lagerloef, G. S. 33-Oceanography
Leben, R. HQ-EE/Wilson, W. S.

NAGW 1138 University of Colorado - Boulder 2486
Space time variability of tropical convection
Period *Obligations*
07/15/87-10/19/89 FY89: TOTAL: \$280,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Salby, M. HQ-EE/Butler, D. M. 31-Atmos Sci
HQ-EE/Theon, J. S.

**NASA'S UNIVERSITY PROGRAM
COLORADO (Continued)**

NAGW 1143 University of Colorado - Boulder 2487
Evaluation of the airborne visible infrared imaging spectrometer for mapping subtle lithological variation
Period *Obligations*
07/01/87-12/31/89 FY89: \$14,693 TOTAL: \$105,608
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Kruse, F. A. HQ-EE/Baltuck, M. 32-Geological Sci
Knepper, D. H. HQ-EE/Ruzek, M.
Lee, K.

NAGW 1176 University of Colorado - Boulder 2488
Magnetotail particle dynamics and curoral region interactions
Period *Obligations*
09/01/87-12/31/89 FY89: TOTAL: \$69,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Speiser, T. W. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Perry, T. W.

NAGW 1183 University of Colorado - Boulder 2489
Mineralogy and composition of Archean crust Greenland a pilot study
Period *Obligations*
06/01/87-05/31/88 FY89: TOTAL: \$36,177
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Goetz, A. F. HQ-EE/Baltuck, M. 32-Geological Sci
HQ-EE/Murphy, R. E.

NAGW 1191 University of Colorado - Boulder 2490
A multidisciplinary research program in support of the Earth observing system
Period *Obligations*
07/01/87-06/30/89 FY89: TOTAL: \$525,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Chase, R. HQ-EE/Tuyahov, A. J. 39-Env Sci, NEC

NAGW 1197 University of Colorado - Boulder 2491
Center for the commercial development of space
Period *Obligations*
10/01/87-10/31/89 FY89: \$1,220,146 TOTAL: \$2,311,146
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Luttges, M. HQ-IC/Oran, W. A. 59-Life Sci, NEC
Berryman, J. HQ-CC/Whitten, R.P.

NAGW 1228 University of Colorado - Boulder 2492
Microwave spectroscopic studies of planetary atmospheres
Period *Obligations*
10/01/87-10/31/89 FY89: \$22,156 TOTAL: \$42,035
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Clancy, R. T. HQ-EL/Bergstralh, J. T. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NAGW 1263 University of Colorado - Boulder 2493
Cassini ultraviolet spectrometer
Period *Obligations*
02/01/88-01/31/90 FY89: \$37,392 TOTAL: \$87,332
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Esposito, L. W. HQ-EL/Mahaffy, P. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NAGW 1264 University of Colorado - Boulder 2494
Image display at the Colorado center for astrodynamics research and development of satellite image display software
Period *Obligations*
01/01/88-12/31/88 FY89: TOTAL: \$38,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Emery, W. J. HQ-EE/Njoku, E. G. 33-Oceanography
Born, G. H. HQ-EE/Wilson, W. S.

NAGW 1293 University of Colorado - Boulder 2495
Understanding mesozonic tectonics in the eastern basin and range province through a study of the Dolly Varden Mountains Nevada by use of imaging spectrometry
Period *Obligations*
05/01/88-12/31/89 FY89: \$79,000 TOTAL: \$143,200
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Atkinson, W. W. HQ-EE/Baltuck, M. 32-Geological Sci
Goetz, A. HQ-EE/Murphy, R.

NAGW 1378 University of Colorado - Boulder 2496
Photometric albedo and thermal studies of Mars
Period *Obligations*
08/01/88-12/31/89 FY89: \$16,700 TOTAL: \$41,700
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lee, S. W. HQ-EL/Underwood, J. R. 32-Geological Sci

NAGW 1387 University of Colorado - Boulder 2497
Evolution of large scale plasma structures in comets kinematics and physics
Period *Obligations*
10/01/88-09/30/89 FY89: \$2,378 TOTAL: \$48,150
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Brandt, J. C. HQ-EL/Rahe, J. H. 11-Astronomy

NAGW 1388 University of Colorado - Boulder 2498
Center for space construction
Period *Obligations*
07/01/88-02/28/90 FY89: \$1,413,675 TOTAL: \$1,913,675
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Morganthaler, G. W. HQ-RM/Hirschbein, M. S. 49-Engr, NEC
Sture, S. HQ-RS/Hartman, S. C.

NAGW 1415 University of Colorado - Boulder 2499
Research in geosciences policy
Period *Obligations*
08/01/88-12/31/89 FY89: \$106,963 TOTAL: \$126,963
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Byerly, R. HQ-EE/Butler, D. M. 39-Env Sci, NEC

NAGW 1440 University of Colorado - Boulder 2500
Mars dust and atmospheric aerosols USSR Phobos mission participation
Period *Obligations*
08/01/88-07/31/89 FY89: TOTAL: \$25,344
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Esposito, L. W. HQ-EL/Brinton, H. C. 13-Physics

NAGW 1462 University of Colorado - Boulder 2501
Max 91 coordination and studies of solar activity on timescales of milliseconds to years
Period *Obligations*
09/30/88-09/29/90 FY89: \$100,000 TOTAL: \$100,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Kiplinger, A. L. HQ-ES/Bohlin, J. D. 13-Physics
HQ-ES/Kane, S.

NAGW 1479 University of Colorado - Boulder 2502
Theoretical astrophysics of cosmic ultraviolet and X ray sources
Period *Obligations*
01/01/89-12/31/89 FY89: \$50,493 TOTAL: \$50,493
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Shull, J. M. HQ-EZ/Kaluzienski, L. J. 11-Astronomy
HQ-EZ/Bunner, A. N.

NASA'S UNIVERSITY PROGRAM **COLORADO (Continued)**

NAGW 1480 University of Colorado - Boulder 2503
X ray observations of late type stars using the ROSAT all sky survey
Period Obligations
09/01/88-08/31/89 FY89: \$43,251 TOTAL: \$43,251
Prin. Invest. NASA Tech. Officer CASE Category
Linsky, J. L. HQ-EZ/Kaluzienski, L. J. 11-Astronomy
Fleming, T. HQ-EZ/Bunner, A. N.

NAGW 1754 University of Colorado - Boulder 2511
Statistical intercomparison and verification of SM/I oceanic precipitation algorithms and system testing a wetnet core project
Period Obligations
03/01/89-02/29/90 FY89: \$250,000 TOTAL: \$250,000
Prin. Invest. NASA Tech. Officer CASE Category
Chase, R. R. HQ-EE/Dodge, J. C. 39-Env Sci, NEC
HQ-EE/Tuyahov, A. J.

NAGW 1491 University of Colorado - Boulder 2504
Stochastic models of uranium dust ring evolution
Period Obligations
12/01/88-11/30/90 FY89: \$53,000 TOTAL: \$53,000
Prin. Invest. NASA Tech. Officer CASE Category
Esposito, L. W. HQ-EL/Quaide, W. L. 19-Phys Sci, NEC

NAGW 1758 University of Colorado - Boulder 2512
Nitric oxide flux calculation
Period Obligations
05/01/89-04/30/90 FY89: \$35,000 TOTAL: \$35,000
Prin. Invest. NASA Tech. Officer CASE Category
Fesen, C. G. HQ-EE/McPeters, R. D. 31-Atmos Sci
HQ-EE/Prather, M. J.

NAGW 1587 University of Colorado - Boulder 2505
Simulation studies of beams in active experiments and space plasmas
Period Obligations
02/01/89-01/31/90 FY89: \$45,000 TOTAL: \$45,000
Prin. Invest. NASA Tech. Officer CASE Category
Winglee, R. W. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Perry, T. W.

NAGW 1786 University of Colorado - Boulder 2513
Artificial intelligence applications for sea ice classification and processes
Period Obligations
04/01/89-03/31/90 FY89: \$78,687 TOTAL: \$78,687
Prin. Invest. NASA Tech. Officer CASE Category
Maslanik, J. HQ-EE/Thomas, R. H. 33-Oceanography
Key, J. R. HQ-EE/Wilson, W. S.

NAGW 1593 University of Colorado - Boulder 2506
Auroral ion heating and wave turbulence in a multi ion plasma
Period Obligations
01/01/89-12/31/89 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. NASA Tech. Officer CASE Category
Speiser, T. HQ-ES/Mellott, M. M. 13-Physics

NAG13-9 University of Colorado - Boulder 2514
A comparative analysis of grid based encoding schemes for use in a geographic information system
Period Obligations
09/22/88-09/30/89 FY89: TOTAL: \$19,720
Prin. Invest. NASA Tech. Officer CASE Category
Hodgson, M. E. SSC/Davis, B. 39-Env Sci, NEC

NAGW 1601 University of Colorado - Boulder 2507
Artificial intelligence for geologic mapping with imaging spectrometers
Period Obligations
02/01/89-01/31/90 FY89: \$159,712 TOTAL: \$159,712
Prin. Invest. NASA Tech. Officer CASE Category
Kruse, F. A. HQ-E/Alexander, J. K. 32-Geological Sci
HQ-E/Holland, D. A.

NAS 5-27263 University of Colorado - Boulder 2515
A study of the response of upper atmosphere parameters to variations of solar activity
Period Obligations
07/07/82-02/28/91 FY89: TOTAL: \$309,857
Prin. Invest. NASA Tech. Officer CASE Category
London, J. GSFC/Rouzer, L. 31-Atmos Sci

NAGW 1622 University of Colorado - Boulder 2508
The evolution of plasmas derived from neutral clouds in planetary magnetospheres
Period Obligations
03/01/89-02/28/90 FY89: \$60,000 TOTAL: \$60,000
Prin. Invest. NASA Tech. Officer CASE Category
Bagenal, F. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Perry, T. W.

NAS 5-27750 University of Colorado - Boulder 2516
Solar stellar irradiance comparison experiment (SOLSTICE) for UARS
Period Obligations
10/01/83-06/30/94 FY89: \$2,181,605 TOTAL: \$7,861,336
Prin. Invest. NASA Tech. Officer CASE Category
Rottman, G. GSFC/Piterski, N. 31-Atmos Sci
GSFC/Donley, J.

NAGW 1716 University of Colorado - Boulder 2509
Basic research in solar physics
Period Obligations
11/01/88-10/31/89 FY89: \$70,000 TOTAL: \$70,000
Prin. Invest. NASA Tech. Officer CASE Category
Linski, J. L. HQ-ES/Bohlin, J. D. 13-Physics
HQ-ES/Kane, S.

NAS 5-28731 University of Colorado - Boulder 2517
Operation of the regional data center for IUE users
Period Obligations
04/01/85-03/31/90 FY89: \$134,114 TOTAL: \$636,654
Prin. Invest. NASA Tech. Officer CASE Category
Snow, T. GSFC/Mead, J. 11-Astronomy
Brugel, E. M.

NAGW 1742 University of Colorado - Boulder 2510
The reduction and analysis of SME UV data
Period Obligations
03/01/89-02/28/90 FY89: \$59,561 TOTAL: \$59,561
Prin. Invest. NASA Tech. Officer CASE Category
Rusch, D. W. HQ-EE/McPeters, R. D. 31-Atmos Sci
HQ-EE/Prather, M. J.

NAS 5-29174 University of Colorado - Boulder 2518
Space station command control and interface technology prototyping
Period Obligations
08/08/85-02/20/91 FY89: \$263,315 TOTAL: \$837,679
Prin. Invest. NASA Tech. Officer CASE Category
Hansen, E. R. GSFC/Tong, G. M. 22-Computer Science
Davis, R. L./Moe, K. L.

NASA'S UNIVERSITY PROGRAM
COLORADO (Continued)

NAS 5-29323 University of Colorado - Boulder 2519 Study of constraints on geomagnetic secular variation modeling from electromagnetism and fluid dynamics of the Earth's core <i>Period</i> <i>Obligations</i> 02/26/86-12/31/87 FY89: TOTAL: \$37,552 <i>Prin. Invest.</i> <i>NASA Tech. Officer</i> <i>CASE Category</i> Benton, E. GSFC/Kouns, C. W. 32-Geological Sci GSFC/Langel, R. A.	NAS 8-31958 University of Colorado - Boulder 2527 Study of geophysical fluid dynamics with electro-hydrodynamics polarization forces <i>Period</i> <i>Obligations</i> 03/26/76-06/30/91 FY89: \$59,412 TOTAL: \$1,439,849 <i>Prin. Invest.</i> <i>NASA Tech. Officer</i> <i>CASE Category</i> Hart, J. E. MSFC/Hall, G. 31-Atmos Sci Toomre, J. MSFC/Fichtl, G. H.
NAS 5-29337 University of Colorado - Boulder 2520 High resolution spectrograph guaranteed time observations <i>Period</i> <i>Obligations</i> 10/04/86-08/26/91 FY89: TOTAL: \$175,887 <i>Prin. Invest.</i> <i>NASA Tech. Officer</i> <i>CASE Category</i> Carpenter, K. GSFC/Vitagliano, H. D. 11-Astronomy	NAS 8-35668 University of Colorado - Boulder 2528 Study entitled particle behavior under low intergranular stresses <i>Period</i> <i>Obligations</i> 11/02/83-09/30/88 FY89: TOTAL: \$251,300 <i>Prin. Invest.</i> <i>NASA Tech. Officer</i> <i>CASE Category</i> Sture, S. MSFC/Gardner, L. B. 39-Env Sci, NEC MSFC/Smith, G. T.
NAS 5-29345 University of Colorado - Boulder 2521 High resolution spectrograph guaranteed time observations <i>Period</i> <i>Obligations</i> 12/16/86-09/30/91 FY89: \$32,000 TOTAL: \$204,000 <i>Prin. Invest.</i> <i>NASA Tech. Officer</i> <i>CASE Category</i> Walter, F. GSFC/Vitagliano, H. D. 11-Astronomy	NASW 4024 University of Colorado - Boulder 2529 Development of a radio impulse detection experiment <i>Period</i> <i>Obligations</i> 11/19/84-10/31/89 FY89: \$64,777 TOTAL: \$236,766 <i>Prin. Invest.</i> <i>NASA Tech. Officer</i> <i>CASE Category</i> Warwick, J. HQ-EL/Mahaffy, P. R. 11-Astronomy HQ-EL/Quaide, W.
NAS 5-30067 University of Colorado - Boulder 2522 Remote hitchhiker instrument support environment research <i>Period</i> <i>Obligations</i> 02/02/87-11/30/89 FY89: TOTAL: \$255,012 <i>Prin. Invest.</i> <i>NASA Tech. Officer</i> <i>CASE Category</i> Hansen, E. R. GSFC/Mandl, D. J. 41-Aero Engr	NASW 4091 University of Colorado - Boulder 2530 Solar mesosphere explores satellite mission operations and data analysis <i>Period</i> <i>Obligations</i> 12/01/85-08/18/89 FY89: \$98,000 TOTAL: \$4,970,971 <i>Prin. Invest.</i> <i>NASA Tech. Officer</i> <i>CASE Category</i> Barth, C. HQ-EE/Esenwein, G. 31-Atmos Sci HQ-EE/Tilford, S. G.
NAS 5-30511 University of Colorado - Boulder 2523 Scientific support for GHRS N team and science verification/guaranteed time observations <i>Period</i> <i>Obligations</i> 03/17/88-09/30/93 FY89: \$238,000 TOTAL: \$342,000 <i>Prin. Invest.</i> <i>NASA Tech. Officer</i> <i>CASE Category</i> Brandt, J. C. GSFC/Vitagliano, H. D. 11-Astronomy	NASW 4115 University of Colorado - Boulder 2531 Development of two-dimensional microchannel array detectors using codcon readout anodes <i>Period</i> <i>Obligations</i> 10/01/85-09/30/88 FY89: \$3,260 TOTAL: \$195,000 <i>Prin. Invest.</i> <i>NASA Tech. Officer</i> <i>CASE Category</i> Lawrence, E. HQ-EZ/Stachnik, R. V. 11-Astronomy HQ-EZ/Bogges, N.
NAS 5-30552 University of Colorado - Boulder 2524 EOS Hiris study <i>Period</i> <i>Obligations</i> 06/30/89-12/14/90 FY89: \$50,000 TOTAL: \$50,000 <i>Prin. Invest.</i> <i>NASA Tech. Officer</i> <i>CASE Category</i> Goetz, A. F. GSFC/Barnes, W. 32-Geological Sci	NCA 2-219 University of Colorado - Boulder 2532 Unsteady three dimensional multiple region analysis <i>Period</i> <i>Obligations</i> 06/01/87-05/31/89 FY89: TOTAL: \$68,743 <i>Prin. Invest.</i> <i>NASA Tech. Officer</i> <i>CASE Category</i> Dougherty, F. C. ARC/Vandalsem, W. R. 41-Aero Engr
NAS 5-30567 University of Colorado - Boulder 2525 Development of generalized catalog interface for astrophysics master directory <i>Period</i> <i>Obligations</i> 06/01/89-06/01/90 FY89: \$71,060 TOTAL: \$71,060 <i>Prin. Invest.</i> <i>NASA Tech. Officer</i> <i>CASE Category</i> Brugel, D. E. GSFC/West, D. K. 22-Computer Science	NCA 2-336 University of Colorado - Boulder 2533 The flow about a V/STOL aircraft hovering in ground effect with a crossflow <i>Period</i> <i>Obligations</i> 03/01/89-02/28/91 FY89: TOTAL: \$38,805 <i>Prin. Invest.</i> <i>NASA Tech. Officer</i> <i>CASE Category</i> Dougherty, F. C. ARC/Van Dalsem, W. R. 41-Aero Engr
NAS 5-30683 University of Colorado - Boulder 2526 The EOS project's investigation definition phase effort for solar stellar irradiance comparison solstice experiment <i>Period</i> <i>Obligations</i> 07/31/89-12/31/91 FY89: \$100,000 TOTAL: \$100,000 <i>Prin. Invest.</i> <i>NASA Tech. Officer</i> <i>CASE Category</i> Rottman, G. G. GSFC/McLennan, D. 13-Physics	NCA 2-367 University of Colorado - Boulder 2534 Salad machine project <i>Period</i> <i>Obligations</i> 10/01/88-09/30/90 FY89: \$40,000 TOTAL: \$40,000 <i>Prin. Invest.</i> <i>NASA Tech. Officer</i> <i>CASE Category</i> Luttges, M. W. ARC/MacElroy, R. D. 41-Aero Engr

NASA'S UNIVERSITY PROGRAM
COLORADO (Continued)

NCA 2-452 University of Colorado - Boulder 2535
 Utilization of the 1.8 meter and mid-deck centrifuges
Period Obligations
 09/01/89-08/31/90 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
 Luttgies, M. W. ARC/Johnson, C. C. 99-Multi-Discip

NCC 2-440 University of Colorado - Boulder 2536
 Hypersonic flow analysis
Period Obligations
 09/01/86-08/31/89 FY89: \$37,325 TOTAL: \$102,887
Prin. Invest. NASA Tech. Officer CASE Category
 Chow, C. Y. ARC/Flores, J. 41-Aero Engr
 ARC/Chaussee, D. S.

NCC 2-473 University of Colorado - Boulder 2537
 Transonic store separation
Period Obligations
 04/01/87-06/30/89 FY89: TOTAL: \$50,000
Prin. Invest. NASA Tech. Officer CASE Category
 Dougherty, F. C. ARC/Chapman, G. T. 41-Aero Engr

NCC 2-508 University of Colorado - Boulder 2538
 Transonic aerolastic analysis for rotor blades
Period Obligations
 10/01/87-09/30/89 FY89: \$40,000 TOTAL: \$80,000
Prin. Invest. NASA Tech. Officer CASE Category
 Chow, C. Y. ARC/Chang, I. C. 41-Aero Engr

NCC 2-630 University of Colorado - Boulder 2539
 Improvement of the Harrier wing-pylon design using computational techniques
Period Obligations
 08/01/89-07/31/91 FY89: \$124,815 TOTAL: \$124,815
Prin. Invest. NASA Tech. Officer CASE Category
 Chow, C. Y. ARC/Stortz, M. W. 41-Aero Engr

NGL 06-003-057 University of Colorado - Boulder 2540
 Basic research in solar physics
Period Obligations
 09/05/87-10/31/88 FY89: TOTAL: \$1,823,758
Prin. Invest. NASA Tech. Officer CASE Category
 Linsky, J. L. HQ-EZ/Ahluwalia, H. S. 13-Physics

NGT 00-050-030 University of Colorado - Boulder 2541
 NASA graduate student researchers program
Period Obligations
 06/01/86-06/30/89 FY89: TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
 Born, G. H. HQ-LE/Owens, F. C. 41-Aero Engr

NGT 00-050-043 University of Colorado - Boulder 2542
 NASA graduate student researchers program
Period Obligations
 08/27/86-02/25/90 FY89: TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
 Shull, J. M. HQ-LE/Owens, F. C. 13-Physics

NGT 00-050-067 University of Colorado - Boulder 2543
 NASA graduate student researchers program
Period Obligations
 06/01/86-05/31/89 FY89: TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
 Culp, R. D. HQ-LE/Owens, F. C. 41-Aero Engr

NGT 00-050-164 University of Colorado - Boulder 2544
 NASA graduate student researchers program
Period Obligations
 06/01/87-05/31/88 FY89: TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
 Dougherty, F. C. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 00-050-236 University of Colorado - Boulder 2545
 NASA graduate student researchers program
Period Obligations
 08/19/87-08/18/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
 Zweibel, E. G. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-246 University of Colorado - Boulder 2546
 NASA graduate student researchers program
Period Obligations
 09/01/87-08/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
 Born, G. H. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 00-050-254 University of Colorado - Boulder 2547
 NASA graduate student researchers program
Period Obligations
 10/01/88-09/30/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
 Park, K. C. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 00-050-279 University of Colorado - Boulder 2548
 NASA graduate student researchers program
Period Obligations
 08/26/88-08/24/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
 Hamilton, A. J. HQ-XE/Owens, F. C. 11-Astronomy

NGT 00-050-326 University of Colorado - Boulder 2549
 NASA graduate student researchers program
Period Obligations
 10/01/88-09/30/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
 Brandt, J. C. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-329 University of Colorado - Boulder 2550
 NASA graduate student researchers program
Period Obligations
 08/01/88-08/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
 Rosborough, G. W. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 00-050-336 University of Colorado - Boulder 2551
 NASA graduate student researchers program
Period Obligations
 08/01/88-08/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
 Born, G. H. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 00-050-367 University of Colorado - Boulder 2552
 NASA graduate student researchers program
Period Obligations
 09/01/88-08/31/90 FY89: TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
 Davis, R. H. HQ-XE/Owens, F. C. 43-Chem Engr

NASA'S UNIVERSITY PROGRAM
COLORADO (Continued)

NGT 00-050-446 University of Colorado - Boulder 2553
 NASA graduate student researchers program
Period Obligations
 06/01/89-05/31/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
 Biringer, S. HQ-XE/Owens, F. C. 43-Chem Engr

NGT 00-050-460 University of Colorado - Boulder 2554
 NASA graduate student researchers program
Period Obligations
 07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
 Rottman, G. J. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-465 University of Colorado - Boulder 2555
 NASA graduate student researchers program
Period Obligations
 07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
 Hay, W. W. HQ-XE/Owens, F. C. 32-Geological Sci

NGT 00-050-483 University of Colorado - Boulder 2556
 NASA graduate student researchers program
Period Obligations
 08/21/89-08/20/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
 Garmany, C. D. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-490 University of Colorado - Boulder 2557
 NASA graduate student researchers program
Period Obligations
 08/15/89-08/14/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
 Goetz, A. F. HQ-XE/Owens, F. C. 32-Geological Sci

NGT 00-050-491 University of Colorado - Boulder 2558
 NASA graduate student researchers program
Period Obligations
 08/30/89-08/29/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
 Born, G. HQ-XE/Owens, F. C. 19-Phys Sci, NEC

NGT 00-070-001 University of Colorado - Boulder 2559
 Graduate student researchers underrepresented minority focus program
Period Obligations
 01/01/87-08/31/89 FY89: \$8,700 TOTAL: \$44,700
Prin. Invest. NASA Tech. Officer CASE Category
 Sture, S. HQ-LE/Owens, F. C. 44-Civil Engr

NGT 00-070-005 University of Colorado - Boulder 2560
 NASA graduate student researchers underrepresented minority focus program
Period Obligations
 01/01/87-12/31/88 FY89: TOTAL: \$31,550
Prin. Invest. NASA Tech. Officer CASE Category
 Bohannon, B. HQ-LE/Owens, F. C. 31-Atmos Sci

NGT 00-070-089 University of Colorado - Boulder 2561
 Graduate student researchers underrepresented minority focus program
Period Obligations
 09/01/88-08/31/90 FY89: TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
 Luttges, M. W. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 06-003-800 University of Colorado - Boulder 2562
 NASA graduate student researchers program
Period Obligations
 08/26/85-08/25/89 FY89: TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
 Shull, J. M. HQ-LE/Owens, F. C. 13-Physics

NSG 5103 University of Colorado - Boulder 2563
 Rocket research in the ultraviolet airglow and aurora of planetary atmospheres
Period Obligations
 02/01/76-11/30/89 FY89: \$160,000 TOTAL: \$3,362,407
Prin. Invest. NASA Tech. Officer CASE Category
 Barth, C. A. GSFC/Early, L. J. 19-Phys Sci, NEC
 Hathaway, D. D. GSFC/Pless, R. H.

NSG 5153 University of Colorado - Boulder 2564
 Research of observed and theoretical variations of atmospheric ozone
Period Obligations
 01/17/77-12/31/89 FY89: \$35,000 TOTAL: \$818,728
Prin. Invest. NASA Tech. Officer CASE Category
 London, J. GSFC/Mc peters, R. 31-Atmos Sci
 Thomas, G. E. HQ-EE/Praher, M.

NSG 5300 University of Colorado - Boulder 2565
 Research of stellar wind velocity in Alpha Cam using ultraviolet data from the International Ultraviolet Explorer (IUE)
Period Obligations
 09/15/78-08/31/90 FY89: \$56,800 TOTAL: \$751,398
Prin. Invest. NASA Tech. Officer CASE Category
 Snow, T. P., Jr. GSFC/West, D. 11-Astronomy
 Joseph, C. L.
 Jenkins, E. B.

NSG 5303 University of Colorado - Boulder 2566
 Ultraviolet measurements with high spectral resolution
Period Obligations
 09/15/78-11/14/89 FY89: \$370,000 TOTAL: \$3,381,689
Prin. Invest. NASA Tech. Officer CASE Category
 Snow Jr., T. P. GSFC/Early, L. J. 11-Astronomy
 McClintock, W. E. GSFC/Pless, R. H.
 Cash, W. C.

NSG 7128 University of Colorado - Boulder 2567
 Studies of X-ray ultraviolet and optical emission from galactic X-ray sources
Period Obligations
 03/01/75-06/30/89 FY89: TOTAL: \$675,990
Prin. Invest. NASA Tech. Officer CASE Category
 McCray, R. HQ-EZ/Kaluzienski, L. 11-Astronomy
 Shull, J. M. HQ-EZ/Weiler, E. J.

NSG 7287 University of Colorado - Boulder 2568
 Study of the solar corona using radio observation
Period Obligations
 07/01/76-10/31/89 FY89: \$71,783 TOTAL: \$668,783
Prin. Invest. NASA Tech. Officer CASE Category
 Dulk, G. A. HQ-ES/Bohlin, J. D. 13-Physics
 HQ-EZ/Spicer, D. S.

NASA'S UNIVERSITY PROGRAM COLORADO (Continued)

NSG 7511 University of Colorado - Boulder 2569
Basic research in solar physics: Energy transport in the solar envelope and atmosphere
Period *Obligations*
10/01/78-11/30/89 FY89: \$126,000 TOTAL: \$901,576
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Toomre, J. HQ-EZ/Spicer, D. S. 13-Physics
Gebbie, K. HQ-EZ/Bohlin, J. D.

NAG 9-384 University of Colorado - Denver 2570
Peptide hormone receptor regulation on human peripheral blood mononuclear cells
Period *Obligations*
07/01/89-07/01/90 FY89: \$35,000 TOTAL: \$35,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Meehan, R. JSC/Sams, C. 56-Medical Sciences

NGT 00-050-318 University of Colorado - Denver 2571
NASA graduate student researchers program
Period *Obligations*
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Stedman, D. H. HQ-XE/Owens, F. C. 12-Chemistry

NGT 00-050-403 University of Colorado - Denver 2572
NASA graduate student researchers program
Period *Obligations*
09/01/89-08/31/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
McCormick, S. F. HQ-XE/Owens, F. C. 21-Mathematics

NAG 9-377 Univ. of Colorado Health Science Center 2573
Effect of psychological stress on immune dysfunction
Period *Obligations*
09/01/89-09/01/90 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Meehan, R. T. JSC/Taylor, G. R. 56-Medical Sciences

NAG 2-351 University of Denver 2574
Infrared measurements of atmospheric constituents
Period *Obligations*
06/01/85-12/31/89 FY89: \$610,468 TOTAL: \$1,366,454
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Murcray, D. G. ARC/Vedder, J. F. 31-Atmos Sci

NAG 2-458 University of Denver 2575
Counting condensation nuclei in the Antarctic ozone mission
Period *Obligations*
05/01/87-12/31/89 FY89: \$76,206 TOTAL: \$198,057
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wilson, J. C. ARC/Wegener, S. S. 31-Atmos Sci
ARC/Condon, B. C.

NAS 1-16306 University of Denver 2576
Science support for Earth radiation budget satellite/stratospheric aerosol and gas experiment
Period *Obligations*
08/22/80-06/12/90 FY89: \$14,970 TOTAL: \$289,228
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Murcray, D. G. LARC/McMaster, L. R. 31-Atmos Sci
LARC/McCormick, M. P.

NAS 5-29311 University of Denver 2577
Measurement of X-rays and entergetic electrons in VLF trigger experiments
Period *Obligations*
01/28/86-01/27/90 FY89: TOTAL: \$98,975
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Barcus, J. GSFC/Goldberg, R. 11-Astronomy

NCC 1-48 University of Denver 2578
Collaborative study of high resolution infrared atmospheric spectra
Period *Obligations*
12/01/80-11/30/90 FY89: \$73,998 TOTAL: \$285,980
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Goldman, A. LARC/Ringland, C. P. 31-Atmos Sci
Murcray, D. G. LARC/Seals, R. K.

NCC 2-470 University of Denver 2579
Counting condensation nuclei in the last year of the stratosphere troposphere exchange project
Period *Obligations*
02/01/87-12/31/89 FY89: \$76,000 TOTAL: \$140,400
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wilson, J. C. ARC/Wegener, S. S. 31-Atmos Sci
ARC/Ferry, G. V.

NGT 00-050-013 University of Denver 2580
NASA graduate student researchers program
Period *Obligations*
07/01/86-06/30/88 FY89: TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Stedman, D. H. HQ-LE/Owens, F. C. 12-Chemistry

NSG 1432 University of Denver 2581
Ground based solar spectral studies
Period *Obligations*
07/11/77-04/10/90 FY89: \$101,933 TOTAL: \$846,223
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Murcray, D. G. LARC/Seals, R. K., Jr. 39-Env Sci, NEC
LARC/Rinsland, C. P.

NCC 2-276 University of Southern Colorado 2582
Independent safety analysis of the x-wing digital control systems
Period *Obligations*
11/01/83-09/30/90 FY89: TOTAL: \$336,365
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Dunn, W. R. ARC/Corliss, L. D. 41-Aero Engr
Karmarkar, J. ARC/Lane, J. W.

NCC 2-373 University of Southern Colorado 2583
Investigation of advanced failure modes analyses and test for Harrier digital avionics
Period *Obligations*
10/01/85-09/30/90 FY89: \$133,189 TOTAL: \$597,958
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Dunn, W. R. ARC/Holland, V. B. 49-Engr, NEC
Lee, M. ARC/Yee, R.

NCC 2-609 University of Southern Colorado 2584
Advanced system assurance technologies
Period *Obligations*
10/01/88-10/31/89 FY89: \$52,901 TOTAL: \$52,901
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Dunn, W. R. ARC/Doty, L. W. 49-Engr, NEC
ARC/Burrous, C. N.

NASA'S UNIVERSITY PROGRAM CONNECTICUT

CONNECTICUT

NAG 1-1033 University of Bridgeport 2585
Parameter refinement of FEM using forced response test data from a stiffened composite cylinder
Period *Obligations*
09/01/89-08/31/90 FY89: \$79,895 TOTAL: \$79,895
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Ojalvo, I. U. LARC/Kvaternik, R. G. 41-Aero Engr

NAG 1-931 University of Connecticut 2586
Cure and degradation studies in polyimides
Period *Obligations*
01/09/89-01/08/90 FY89: \$49,877 TOTAL: \$49,877
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Sung, C. S. LARC/Young, P. R. 12-Chemistry
Huang, S. J.

NAG 3-512 University of Connecticut 2587
Biaxial constitutive equation development
Period *Obligations*
01/06/84-11/14/87 FY89: TOTAL: \$378,271
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Jordan, E. LERC/Thompson, R. L. 41-Aero Engr

NAG 3-854 University of Connecticut 2588
X ray based extensometry
Period *Obligations*
12/18/87-12/17/88 FY89: TOTAL: \$52,783
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Jordon, E. H. LERC/Fralick, G. C. 46-Mech Engr
Pease, D. M. LERC/Williams, W. D.

NAG 3-882 University of Connecticut 2589
Nonlinear mechanics of composites with a periodic microstructure
Period *Obligations*
03/10/88-03/08/90 FY89: \$50,000 TOTAL: \$99,978
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Jordan, E. H. LERC/Thompson, R. L. 41-Aero Engr

NAG 3-1004 University of Connecticut 2590
X ray based extensometry
Period *Obligations*
02/06/89-02/05/90 FY89: \$49,998 TOTAL: \$49,998
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Jordan, E. H. LERC/Fralick, G. C. 46-Mech Engr
Pease, D. M.

NCC10-2 University of Connecticut 2591
Porous membrane biomass growth systems for CELSS which confines and supplies nutrient solution on demand
Period *Obligations*
06/01/88-07/31/89 FY89: \$22,294 TOTAL: \$22,294
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Koontz, H. KSC/Knott, W. M. 55-Agriculture Sci

NAG 1-897 Yale University 2592
Critical workloads a Markov reward application
Period *Obligations*
08/01/88-07/31/90 FY89: \$65,403 TOTAL: \$117,053
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Smith, R. M. LARC/Sjogren, J. A. 22-Computer Science

NAG 1-1034 Yale University 2593
Relaminarization and retransition in supersonic boundary layers
Period *Obligations*
07/01/89-06/30/90 FY89: \$29,990 TOTAL: \$29,990
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Sreenivasan, K. R. LARC/Kumar, A. 41-Aero Engr

NAG 2-535 Yale University 2594
Uses of the astrometric telescope facility (ATF) for stellar astrophysics
Period *Obligations*
08/01/88-07/31/90 FY89: \$20,000 TOTAL: \$20,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Sofia, S. ARC/Nishioka, K. 11-Astronomy

NAG 3-834 Yale University 2595
Theoretical damage mechanics for metal composites
Period *Obligations*
11/08/87-01/07/90 FY89: \$62,000 TOTAL: \$137,012
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Onat, E. T. LERC/Arnold, S. M. 46-Mech Engr

NAG 3-884 Yale University 2596
Theory of chemical vapor deposition processes for advanced ceramic coatings
Period *Obligations*
03/01/88-10/31/89 FY89: TOTAL: \$80,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Rosner, D. LARC/Stearns, C. A. 19-Phys Sci, NEC

NAG 3-898 Yale University 2597
Theoretical studies in support of the 3m vapor transport experiments
Period *Obligations*
04/07/88-01/06/89 FY89: TOTAL: \$26,751
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Rosner, D. E. LERC/Roberts, G. D. 47-Materials Engr
LERC/Chait, A.

NAG 3-996 Yale University 2598
Fuel rich catalytically stabilized combustion for aircraft engine applications
Period *Obligations*
01/23/89-12/31/89 FY89: \$51,850 TOTAL: \$51,850
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Pletterle, L. D. LERC/Lee, C. M. 99-Multi-Discip
Horvath, C. Oliver, A.

NAG 5-736 Yale University 2599
Solar radius luminosity studies
Period *Obligations*
02/15/86-05/14/90 FY89: \$40,000 TOTAL: \$244,362
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Sofia, S. GSFC/Maier, E. J. 31-Atmos Sci

NAG 5-871 Yale University 2600
The dynamics and remote sensing of tropopause folding
Period *Obligations*
02/15/87-08/31/90 FY89: \$85,000 TOTAL: \$234,858
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Smith, R. B. GSFC/Uccellini, L. W. 31-Atmos Sci

NASA'S UNIVERSITY PROGRAM **CONNECTICUT (Continued)**

NAG 5-1244 **Yale University** **2601**
Superconducting films for single photon X ray detectors
Period *Obligations*
08/15/89-08/14/90 FY89: \$30,000 TOTAL: \$30,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Prober, D. E. GSFC/Moseley, S. H. 13-Physics

NAG 8-785 **Yale University** **2602**
Satellite data application to study global weather systems
Period *Obligations*
05/12/89-07/27/90 FY89: \$104,000 TOTAL: \$104,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Saltzman, B. MSFC/Kaufman, J. W. 31-Atmos Sci
MSFC/Leslie, F. W.

NAG 9-93 **Yale University** **2603**
Early differentiation of the morn: Experimental and modeling studies
Period *Obligations*
02/01/85-03/01/89 FY89: TOTAL: \$297,140
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Longhi, J. JSC/Browne, I. D. 47-Materials Engr

NAGW 777 **Yale University** **2604**
Global modeling of years-to-centuries timescales solar phenomena with probable terrestrial consequences
Period *Obligations*
07/01/85-09/30/90 FY89: \$235,000 TOTAL: \$886,375
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Demarque, P. HQ-ES/Mellott, M. M. 11-Astronomy
Sofia, S. HQ-ES/Eastman, T.

NAGW 778 **Yale University** **2605**
Theoretical studies of the solar stellar connection with the aid of space vehicles
Period *Obligations*
08/01/85-01/31/90 FY89: \$78,000 TOTAL: \$331,274
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Demarque, P. HQ-EZ/Clayton, G. C. 41-Aero Engr
HQ-EZ/Bunner, A.

NAGW 1402 **Yale University** **2606**
Planning for the national laboratory of space plant biology
Period *Obligations*
07/01/88-06/30/89 FY89: TOTAL: \$30,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Galston, A. W. HQ-EB/Averner, M. M. 51-Biological Sci

NAS 8-36356 **Yale University** **2607**
Application of dynamical systems theory to global weather phenomena
Period *Obligations*
09/30/85-12/01/89 FY89: \$67,000 TOTAL: \$427,213
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Saltzman, B. MSFC/Kaufman, J. W. 31-Atmos Sci
Turekian, K. MSFC/Spray, C.

NGT 00-050-252 **Yale University** **2608**
NASA graduate student researchers program
Period *Obligations*
08/01/87-07/31/89 FY89: TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Burch, W. HQ-XE/Owens, F. C. 39-Env Sci, NEC

NGT 00-050-266 **Yale University** **2609**
NASA graduate student researchers program
Period *Obligations*
09/01/88-08/31/90 FY89: \$36,000 TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Reifsnnyder, W. E. HQ-XE/Owens, F. C. 99-Multi-Discip

NGT 00-050-284 **Yale University** **2610**
NASA graduate student researchers program
Period *Obligations*
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Ma, T. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-377 **Yale University** **2611**
NASA graduate student researchers program
Period *Obligations*
09/01/88-08/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Rosner, D. E. HQ-XE/Owens, F. C. 43-Chem Engr

NGT 07-001-800 **Yale University** **2612**
NASA graduate student researchers program
Period *Obligations*
08/01/85-07/31/89 FY89: TOTAL: \$53,245
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Demarque, P. HQ-LE/Owens, F. C. 11-Astronomy

NSG 7290 **Yale University** **2613**
Membranes and circadian rhythms in plants
Period *Obligations*
10/01/76-10/31/89 FY89: TOTAL: \$615,790
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Galston, A. W. HQ-EB/Halstead, T. W. 51-Biological Sci
HQ-EB/Devincenzi, D. L.

DELAWARE

NAG 3-422 **University of Delaware** **2614**
Advanced concepts for high efficiency GaAs concentrator solar cells for space applications
Period *Obligations*
04/25/83-08/21/89 FY89: TOTAL: \$163,339
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Barnett, A. M. LERC/Curtis, H. B. 19-Phys Sci, NEC
LERC/Flood, D. J.

NAG 5-853 **University of Delaware** **2615**
A high resolution climatology of the terrestrial seasonal water cycle
Period *Obligations*
10/01/86-06/30/90 FY89: \$19,688 TOTAL: \$130,388
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Willmott, C. J. GSFC/Oseroff, H. 19-Phys Sci, NEC

NAG 5-856 **University of Delaware** **2616**
On board data processing and analysis system for astromoy
Period *Obligations*
10/15/86-10/14/89 FY89: \$1,750 TOTAL: \$5,250
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Evenson, P. GSFC/Ormes, J. A. 42-Astro Engr

NASA'S UNIVERSITY PROGRAM DELAWARE (Continued)

NAG 5-915	University of Delaware	2617	Micrometeorological field measurements in support of life
<i>Period</i>	<i>Obligations</i>		
06/15/87-01/31/90	FY89: \$33,727	TOTAL: \$105,898	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Klemas, V.	GSFC/Toll, D. L.	39-Env Sci, NEC	
Field, R. T.	GSFC/Gurney, R. J.		
NAG 5-972	University of Delaware	2618	Helium rich white dwarf stars
<i>Period</i>	<i>Obligations</i>		
09/01/87-11/30/90	FY89: \$30,534	TOTAL: \$77,653	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Shipman, H. L.	GSFC/West, D.	11-Astronomy	
NAG 8-662	University of Delaware	2619	Chemical evolution and pulsation of hot white dwarf stars
<i>Period</i>	<i>Obligations</i>		
08/01/87-07/31/88	FY89:	TOTAL: \$18,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Shipman, H. L.	MSFC/Harper, B.	11-Astronomy	
NAGW 374	University of Delaware	2620	Remote sensing investigations of wetland biomass and productivity for global biosystems research
<i>Period</i>	<i>Obligations</i>		
12/01/82-09/14/89	FY89: \$12,262	TOTAL: \$412,790	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Klenas, V.	HQ-EB/Averner, M. M.	51-Biological Sci	
Hardisky, M. A.	HQ-EB/Devincenzi, D. L.		
NAGW 950	University of Delaware	2621	Discrimination of wetlands vegetation using imaging spectrometry
<i>Period</i>	<i>Obligations</i>		
08/15/86-10/14/88	FY89: \$800	TOTAL: \$49,582	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Klemas, V.	HQ-EE/Wickland, D. E.	39-Env Sci, NEC	
	HQ-EE/Ruzek, M. J.		
NAGW 1040	University of Delaware	2622	Isotopic composition of cosmic ray helium from 0.3 to 1.8 gey nucleon
<i>Period</i>	<i>Obligations</i>		
02/15/87-02/14/90	FY89: \$100,000	TOTAL: \$339,574	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Evenson, P.	HQ-EZ/Jones, W. V.	13-Physics	
NAGW 1295	University of Delaware	2623	Coordinated research on nonthermal astrophysics
<i>Period</i>	<i>Obligations</i>		
04/01/88-04/30/90	FY89: \$104,000	TOTAL: \$204,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Mullan, D. J.	HQ-ES/Mellott, M. M.	13-Physics	
	HQ-ES/Jones, W. V.		
NAGW 1437	University of Delaware	2624	Interdisciplinary scientist in Phobos project
<i>Period</i>	<i>Obligations</i>		
06/01/88-06/30/89	FY89:	TOTAL: \$28,750	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Ness, N. F.	HQ-EL/Brinton, H. C.	13-Physics	
NAGW 1514	University of Delaware	2625	Low frequency magnetic field waves at Uranus
<i>Period</i>	<i>Obligations</i>		
12/01/88-11/30/89	FY89: \$40,000	TOTAL: \$40,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Smith, C.	HQ-EL/Quaide, W.	19-Phys Sci, NEC	
NAGW 1644	University of Delaware	2626	Theoretical studies in cosmic physics
<i>Period</i>	<i>Obligations</i>		
03/01/89-02/28/90	FY89: \$60,000	TOTAL: \$60,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Gaisser, T. K.	HQ-ES/Mellott, M. M.	13-Physics	
	HQ-ES/Jones, W. V.		
NAGW 1674	University of Delaware	2627	Coordination of computer networking in support of NASA's ocean processes program
<i>Period</i>	<i>Obligations</i>		
01/01/89-07/31/90	FY89: \$129,492	TOTAL: \$129,492	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Webster, F.	HQ-EE/Lagerloef, G. S.	33-Oceanography	
	HQ-EE/Wilson, W. S.		
NAS 1-18758	University of Delaware	2628	Tailored composite structures of ordered staple thermoplastic materials
<i>Period</i>	<i>Obligations</i>		
09/30/88-09/30/90	FY89:	TOTAL: \$106,400	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Pipes, R. B.	LARC/Jegley, D. C.	47-Materials Engr	
Santare, M. H.	LARC/Shuart, M. J.		
NAS 3-25791	University of Delaware	2629	Modeling and characterization of multi-dimensionally reinforced ceramic matrix composites
<i>Period</i>	<i>Obligations</i>		
09/26/89-01/10/91	FY89: \$50,000	TOTAL: \$50,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Chou, T. W.	LERC/Gyekenyesi, J. P.	41-Aero Engr	
Malidi, A. P.			
NGT 00-050-205	University of Delaware	2630	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
06/01/87-06/01/90	FY89: \$18,000	TOTAL: \$54,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Evenson, P. A.	HQ-XE/Owens, F. C.	13-Physics	
NGT 00-050-338	University of Delaware	2631	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
08/01/88-07/31/90	FY89: \$18,000	TOTAL: \$36,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Matthaeus, W. H.	HQ-XE/Owens, F. C.	13-Physics	

DISTRICT OF COLUMBIA

NASW 4236	The American University	2632	Research and write a history of NASA's organizational culture
<i>Period</i>	<i>Obligations</i>		
07/01/87-11/30/89	FY89: \$26,732	TOTAL: \$114,402	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
McCurdy, H. E.	HQ-LB/Fries, S. D.	73-History	

NASA'S UNIVERSITY PROGRAM **DISTRICT OF COLUMBIA (Continued)**

NGT 00-050-333 The American University 2633
 NASA graduate student researchers program
Period *Obligations*
 09/07/88-09/06/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
 Kay, R. B. HQ-XE/Owens, F. C. 13-Physics

NAG 5-296 The Catholic University of America 2634
 The sharp lined features in the ultraviolet spectra of hot white dwarfs
Period *Obligations*
 09/15/87-09/14/90 FY89: \$66,000 TOTAL: \$540,423
Prin. Invest. NASA Tech. Officer CASE Category
 Bruhweiler, F. C. GSFC/West, D. K. 11-Astronomy
 Montrose, C. Fekel, F.

NAG 5-311 The Catholic University of America 2635
 Query decomposition of multiple queries
Period *Obligations*
 04/15/83-05/31/90 FY89: TOTAL: \$244,879
Prin. Invest. NASA Tech. Officer CASE Category
 Welch, J. N. GSFC/Jacobs, B. 22-Computer Science
 GSFC/Berbert, J. H.

NAG 5-520 The Catholic University of America 2636
 Research relative to active control of flexible spacecraft structures
Period *Obligations*
 03/15/85-10/14/88 FY89: TOTAL: \$112,154
Prin. Invest. NASA Tech. Officer CASE Category
 Baz, A. M. GSFC/Osborne, E. P. 46-Mech Engr
 GSFC/Studer, P. A.

NAG 5-596 The Catholic University of America 2637
 An investigation of the largescale structure of the galactic interstellar medium
Period *Obligations*
 08/01/85-01/31/89 FY89: TOTAL: \$16,967
Prin. Invest. NASA Tech. Officer CASE Category
 Bruhweiler, F. C. GSFC/Hallam, K. L. 11-Astronomy

NAG 5-749 The Catholic University of America 2638
 Research relation to distributed control of large flexible space structures
Period *Obligations*
 03/15/86-11/14/89 FY89: TOTAL: \$122,252
Prin. Invest. NASA Tech. Officer CASE Category
 Baz, A. GSFC/Fedor, J. V. 45-Elec Engr
 Nguyen, C. C.

NAG 5-780 The Catholic University of America 2639
 Active control of robot manipulator compliance
Period *Obligations*
 05/15/86-01/31/90 FY89: \$50,072 TOTAL: \$196,275
Prin. Invest. NASA Tech. Officer CASE Category
 Nguyen, C. C. GSFC/Premack, T. 45-Elec Engr

NAG 5-848 The Catholic University of America 2640
 The containment vessels and architecture for the particle astrophysics magnet facility
Period *Obligations*
 09/15/86-01/31/90 FY89: TOTAL: \$74,153
Prin. Invest. NASA Tech. Officer CASE Category
 Dame, R. E. GSFC/Ormes, J. F. 42-Astro Engr
 Kao, T.

NAG 5-864 The Catholic University of America 2641
 Development of a theoretical model for annealing of radiation damage in semiconductor devices
Period *Obligations*
 12/15/86-03/31/90 FY89: \$124,600 TOTAL: \$318,527
Prin. Invest. NASA Tech. Officer CASE Category
 Litovchenko, V. GSFC/Danchenko, V. 13-Physics
 GSFC/Brown, S.

NAG 5-1036 The Catholic University of America 2642
 Support calculations for staircase diodes low noise avalanche photodiodes
Period *Obligations*
 03/01/88-11/30/89 FY89: \$12,217 TOTAL: \$22,392
Prin. Invest. NASA Tech. Officer CASE Category
 Meijer, P. H. GSFC/Forrest, K. 13-Physics

NAG 5-1037 The Catholic University of America 2643
 Passive vibration control of flexible structures
Period *Obligations*
 03/01/88-08/31/89 FY89: TOTAL: \$40,750
Prin. Invest. NASA Tech. Officer CASE Category
 Baz, A. M. GSFC/Fedor, J. V. 46-Mech Engr

NAG 5-1124 The Catholic University of America 2644
 Design of advanced control schemes for telerobot manipulator
Period *Obligations*
 03/15/89-03/14/90 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
 Nguyen, C. C. GSFC/Mosier, G. E. 49-Engr, NEC
 GSFC/Schnurr, R. G.

NAG 5-1262 The Catholic University of America 2645
 A multi bandpass study of the large Magellanic cloud LMC from infrared through X ray wavelengths
Period *Obligations*
 09/01/89-11/30/89 FY89: \$7,500 TOTAL: \$7,500
Prin. Invest. NASA Tech. Officer CASE Category
 Bruhweiler, F. C. GSFC/West, D. 11-Astronomy

NAG 5-1285 The Catholic University of America 2646
 Evaluations of performance of platform data management system under various degrees of protocol implementation
Period *Obligations*
 10/01/89-09/30/90 FY89: \$49,085 TOTAL: \$49,085
Prin. Invest. NASA Tech. Officer CASE Category
 Arozullah, M. GSFC/Westcott, R. D. 49-Engr, NEC
 GSFC/Rothe, E.

NAGW 1057 The Catholic University of America 2647
 Three dimensional magnetospheric current system and acceleration of particles in the magnetotail
Period *Obligations*
 04/15/87-04/14/88 FY89: TOTAL: \$46,091
Prin. Invest. NASA Tech. Officer CASE Category
 Whang, Y. C. HQ-EE/Fitzenreiter, R. J. 13-Physics
 Xu, R. L. HQ-EE/Eastman, T. E.

NAGW 1323 The Catholic University of America 2648
 Theoretical studies of CME associated slow shocks
Period *Obligations*
 03/01/88-05/30/90 FY89: \$25,000 TOTAL: \$75,000
Prin. Invest. NASA Tech. Officer CASE Category
 Whang, Y. C. HQ-ES/Bohlin, J. D. 46-Mech Engr
 HQ-ES/Kane, S.

NASA'S UNIVERSITY PROGRAM
DISTRICT OF COLUMBIA (Continued)

NAGW 1365 The Catholic University of America 2649
 Solar flare gamma ray line shapes
Period *Obligations*
 07/01/88-06/31/89 FY89: TOTAL: \$15,000
Prin. Invest. NASA Tech. Officer CASE Category
 Wernitz, C. HQ-EZ/Ahluwalia, H. S. 13-Physics

NAGW 1595 The Catholic University of America 2650
 Solar wind structures in the outer heliosphere
Period *Obligations*
 12/01/88-11/30/89 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. NASA Tech. Officer CASE Category
 Whang, Y. C. HQ-ES/Mellott, M. M. 13-Physics
 HQ-ES/Jones, W. V.

NGT 00-070-043 The Catholic University of America 2651
 Graduate student researchers underrepresented minority focus program
Period *Obligations*
 09/01/87-08/31/89 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
 Bruhweiler, F. HQ-XE/Owens, F. C. 13-Physics

NSG 5066 The Catholic University of America 2652
 Research of solar hard X-rays and gamma-rays
Period *Obligations*
 05/01/75-04/30/90 FY89: \$178,945 TOTAL: \$1,174,635
Prin. Invest. NASA Tech. Officer CASE Category
 Wernitz, C. GSFC/Trombka, J. I. 11-Astronomy
 Starr, R. GSFC/Schmadebeck, R. L.

NSG 5173 The Catholic University of America 2653
 Atom-molecule reactions of chemical importance in the stratosphere
Period *Obligations*
 06/01/77-04/30/90 FY89: \$66,336 TOTAL: \$474,368
Prin. Invest. NASA Tech. Officer CASE Category
 Guiman, D. GSFC/Nava, D. F. 12-Chemistry
 Michael, J. V.

NGT 00-090-013 Gallaudet College 2654
 A model summer program for handicapped college students
Period *Obligations*
 05/01/88-04/30/90 FY89: \$43,759 TOTAL: \$80,651
Prin. Invest. NASA Tech. Officer CASE Category
 Nissen HQ-U/Margolis, M. 49-Engr, NEC

NAG 1-158 George Washington University 2655
 Effects of low velocity impact on strength characteristics of composite materials laminates
Period *Obligations*
 03/01/81-08/31/88 FY89: TOTAL: \$428,548
Prin. Invest. NASA Tech. Officer CASE Category
 Liebowitz, H. LARC/Mixson, J. S. 47-Materials Engr
 Moyer Jr., E. T. LARC/Bostaph, G. M.

NAG 1-728 George Washington University 2656
 Effective reanalysis strategies for large scale design optimization
Period *Obligations*
 01/01/87-01/31/90 FY89: \$45,000 TOTAL: \$139,968
Prin. Invest. NASA Tech. Officer CASE Category
 Liebowitz, H. LARC/Gardner, J. 41-Aero Engr

NAG 1-730 George Washington University 2657
 Computational strategy for predicting the dynamic response of composite structures during impact
Period *Obligations*
 01/01/87-12/31/89 FY89: \$65,000 TOTAL: \$194,998
Prin. Invest. NASA Tech. Officer CASE Category
 Noor, A. K. LARC/Carden, H. D. 41-Aero Engr
 LARC/Robinson, M. P.

NAG 1-771 George Washington University 2658
 Statistical modelling of software reliability
Period *Obligations*
 07/01/87-12/31/89 FY89: TOTAL: \$157,000
Prin. Invest. NASA Tech. Officer CASE Category
 Miller, D. R. LARC/Finelli, G. B. 29-Math/Computer, NEC
 LARC/Dotson, K. J.

NAG 1-788 George Washington University 2659
 Transverse stresses in laminated composite panels
Period *Obligations*
 07/01/87-06/30/90 FY89: \$50,000 TOTAL: \$140,000
Prin. Invest. NASA Tech. Officer CASE Category
 Liebowitz, H. LARC/Starnes, J. H. 41-Aero Engr
 Noor, A. K.

NAG 1-852 George Washington University 2660
 Nonlinear analysis and modeling of tires
Period *Obligations*
 02/01/88-04/30/90 FY89: \$65,000 TOTAL: \$130,000
Prin. Invest. NASA Tech. Officer CASE Category
 Liebowitz, H. LARC/Robinson, M. P. 46-Mech Engr
 Noor, A. K. LARC/Lopez, M. C.

NAG 3-642 George Washington University 2661
 Whisher growth under conditions which resemble those available on an orbiting space laboratory
Period *Obligations*
 06/10/85-06/30/89 FY89: TOTAL: \$119,240
Prin. Invest. NASA Tech. Officer CASE Category
 Hobbs, H. H. LERC/Westfall, L. J. 47-Materials Engr

NAG 3-860 George Washington University 2662
 Rotating ejectors
Period *Obligations*
 01/10/88-02/01/90 FY89: \$42,023 TOTAL: \$92,023
Prin. Invest. NASA Tech. Officer CASE Category
 Garri, C. A. LERC/Rostafinski, W. 41-Aero Engr
 Foa, J. V. LERC/Luidens, R.

NAG 3-883 George Washington University 2663
 Marangoni suppression in microgravity
Period *Obligations*
 03/01/88-02/28/89 FY89: TOTAL: \$94,412
Prin. Invest. NASA Tech. Officer CASE Category
 Dressler, R. F. LERC/Salzman, J. A. 46-Mech Engr
 Sivakumaran, N. S.

NAG 3-1001 George Washington University 2664
 Novel mode of left augmentation
Period *Obligations*
 02/01/89-01/31/90 FY89: \$12,977 TOTAL: \$12,977
Prin. Invest. NASA Tech. Officer CASE Category
 Foa, J. V. LERC/Luidens, R. W. 41-Aero Engr
 Garri, C. LERC/Rostafinski, W. A.

**NASA'S UNIVERSITY PROGRAM
DISTRICT OF COLUMBIA (Continued)**

NAG 3-1012	George Washington University		2665
	Paddel jet ejector proposal for a first quantitative demonstration phase		
	<i>Period</i>	<i>Obligations</i>	
	02/10/89-04/09/89	FY89: \$7,999	TOTAL: \$7,999
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Foa, J. V.	LERC/Luidens, R. W.	41-Aero Engr
	Garris, C.	LERC/Rostafinski, W. A.	
NAG 5-265	George Washington University		2666
	Discrete random media techniques for microwave modeling of vegetated terrain		
	<i>Period</i>	<i>Obligations</i>	
	08/15/82-01/31/90	FY89: \$2,500	TOTAL: \$353,116
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Chauhan, N.	GSFC/Oseroff, H.	55-Agriculture Sci
NAG 5-834	George Washington University		2667
	Thermal fluid mechanic characteristics of the capillary pump		
	<i>Period</i>	<i>Obligations</i>	
	09/01/86-01/31/90	FY89:	TOTAL: \$159,748
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Kiper, A. M.	GSFC/Swanson, T. D.	46-Mech Engr
		GSFC/McIntosh, R.	
NAG 8-788	George Washington University		2668
	Developing an Earth science data policy		
	<i>Period</i>	<i>Obligations</i>	
	08/10/89-08/09/92	FY89: \$73,333	TOTAL: \$73,333
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Logsdon, J. M.	MSFC/Stephens, J. B.	19-Phys Sci, NEC
	Shaffer, L. R.	MSFC/Wilson, G. S.	
NAGW 720	George Washington University		2669
	New deterministic forecasting method for density currents and winds over mountainous terrain		
	<i>Period</i>	<i>Obligations</i>	
	01/01/85-09/30/88	FY89:	TOTAL: \$346,210
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Dressler, R. F.	HQ-EE/Curran, R. J.	31-Atmos Sci
	Sivakumaran, N. S.	HQ-EE/Theon, J. S.	
NAGW 1164	George Washington University		2670
	Technical needs and research opportunities provided by projected aeronautical and space systems		
	<i>Period</i>	<i>Obligations</i>	
	09/01/87-09/30/89	FY89: \$35,000	TOTAL: \$70,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Noor, A. K.	HQ-RM/Venneri, S. L.	41-Aero Engr
		HQ-RM/Mulville, D.	
NAS 1-18458	George Washington University		2671
	Experimental and analytical engineering and other science support		
	<i>Period</i>	<i>Obligations</i>	
	04/13/87-04/12/92	FY89: \$547,362	TOTAL: \$1,517,507
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Wolfson, B. E.	LARC/Massenberg, S. E.	41-Aero Engr
		LARC/Prior, E. J.	
NAS 5-30092	George Washington University		2672
	Research for the integration of the UIMS system		
	<i>Period</i>	<i>Obligations</i>	
	03/20/87-03/19/90	FY89: \$64,832	TOTAL: \$245,224
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Sibert, J. L.	GSFC/Truskowski, W. F.	22-Computer Science
NASW 4237	George Washington University		2673
	Research and write a history of international participation in the U.S. Space station program		
	<i>Period</i>	<i>Obligations</i>	
	08/04/87-02/28/90	FY89:	TOTAL: \$71,894
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Logsdon, J. M.	HQ/Fries, S.	73-History
NASW 4324	George Washington University		2674
	Editorial support for the life sciences division		
	<i>Period</i>	<i>Obligations</i>	
	07/01/88-06/30/90	FY89: \$400,000	TOTAL: \$780,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Dutcher, F. R.	HQ-EB/Halstead, T.	59-Life Sci, NEC
NASW 4412	George Washington University		2675
	Research and compile a documentary history of the space age		
	<i>Period</i>	<i>Obligations</i>	
	05/11/89-12/31/91	FY89: \$168,140	TOTAL: \$168,140
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Logsdon, J. M.	HQ/Fries, S. D.	73-History
	Williamson, R. A.		
NCC 1-14	George Washington University		2676
	Aeroacoustics research program in Joint Institute for Advancement of Flight Sciences (JIAFS)		
	<i>Period</i>	<i>Obligations</i>	
	05/15/79-10/31/89	FY89: \$173,169	TOTAL: \$1,354,588
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Liebowitz, H.	LARC/Clark, L. R.	41-Aero Engr
	Myers, M. K.	LARC/Stephens, D. G.	
NCC 1-24	George Washington University		2677
	Programs of research in flight sciences		
	<i>Period</i>	<i>Obligations</i>	
	08/15/79-01/31/90	FY89: \$180,500	TOTAL: \$1,375,463
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Liebowitz, H.	LARC/Bright, R. T.	41-Aero Engr
	Whitesides, J. L.		
NCC 1-29	George Washington University		2678
	Research program in flight dynamics in the Joint Institute for Advancement of Flight Sciences (JIAFS) at the NASA Langley Research Center		
	<i>Period</i>	<i>Obligations</i>	
	12/01/79-11/30/89	FY89: \$174,073	TOTAL: \$1,108,469
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Liebowitz, H.	LARC/Batterson, J. G.	41-Aero Engr
		LARC/Murphy, P. C.	
NCC 1-47	George Washington University		2679
	A core program in the Joint Institute for Advancement of Flight Sciences at the NASA Langley Research Center		
	<i>Period</i>	<i>Obligations</i>	
	11/04/80-10/31/89	FY89: \$357,000	TOTAL: \$2,427,571
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Liebowitz, H.	LARC/Massenberg, S. E.	41-Aero Engr
	Whitesides, J. L.	LARC/Barnwell, R. W.	
NCC 1-104	George Washington University		2680
	Astronautics in the Joint Institute for Advancement of Flight Sciences JIAFS		
	<i>Period</i>	<i>Obligations</i>	
	05/01/86-05/31/90	FY89: \$156,374	TOTAL: \$524,744
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Liebowitz, H.	LARC/Arrington, J. P.	42-Astro Engr

NASA'S UNIVERSITY PROGRAM
DISTRICT OF COLUMBIA (Continued)

NCC 5-43 George Washington University 2681
 Cooperative research and education in space systems technologies
Period Obligations
 10/01/89-09/30/90 FY89: \$165,941 TOTAL: \$165,941
Prin. Invest. NASA Tech. Officer CASE Category
 Liebowitz, H. GSFC/Busse, J. R. 42-Astro Engr
 Kramer, B. GSFC/Robinson, J. H.
 Whitesides, J. L.

NGR 09-010-078 George Washington University 2682
 Research programs in structures and dynamics
Period Obligations
 01/06/72-06/30/88 FY89: TOTAL: \$2,902,047
Prin. Invest. NASA Tech. Officer CASE Category
 Liebowitz, H. LARC/Robinson, M. P. 41-Aero Engr
 Noor, A. K. LARC/Card, M. F.

NGR 09-010-085 George Washington University 2683
 Aircraft noise reduction research
Period Obligations
 02/21/73-06/30/90 FY89: TOTAL: \$699,704
Prin. Invest. NASA Tech. Officer CASE Category
 Liebowitz, H. LARC/Clark, L. R. 41-Aero Engr

NSG 5109 George Washington University 2684
 Decoding and performance of error correcting codes
Period Obligations
 07/16/76-04/30/90 FY89: \$144,000 TOTAL: \$685,746
Prin. Invest. NASA Tech. Officer CASE Category
 Helgert, H. J. GSFC/Poland, W., Jr. 49-Engr, NEC
 GSFC/Miller, W. H.

NAG 5-1066 Georgetown University 2685
 Simulations of evolutionary dynamic systems with the massively parallel processor
Period Obligations
 08/01/88-01/15/90 FY89: TOTAL: \$25,000
Prin. Invest. NASA Tech. Officer CASE Category
 Earley, J. E. GSFC/Fischer, J. R. 51-Biological Sci
 GSFC/Dorband, J. E.

NGT 09-009-800 Georgetown University 2686
 Science technology and diplomacy training program
Period Obligations
 01/01/84-12/31/88 FY89: TOTAL: \$99,999
Prin. Invest. NASA Tech. Officer CASE Category
 Krogh, P. F. HQ-LE/Owens, F. C. 49-Engr, NEC

NAG 1-383 Howard University 2687
 Large space structures institute
Period Obligations
 07/11/83-04/30/88 FY89: TOTAL: \$1,737,500
Prin. Invest. NASA Tech. Officer CASE Category
 Broome Jr., T. H. LARC/Housner, J. M. 46-Mech Engr
 Bainum, P. M. LARC/Juang, J.
 Reiss, R.

NAG 2-585 Howard University 2688
 Project to reconstruct halocene environments on a karstic plain
Period Obligations
 06/01/89-10/31/89 FY89: \$34,955 TOTAL: \$34,955
Prin. Invest. NASA Tech. Officer CASE Category
 Dahlin, B. H. ARC/Matson, P. A. 54-Env Biology
 ARC/Duller, C. E.

NAG 3-887 Howard University 2689
 Development of epitaxial silicon carbide
Period Obligations
 03/15/88-10/14/89 FY89: TOTAL: \$281,926
Prin. Invest. NASA Tech. Officer CASE Category
 Harris, G. L. LERC/Powell, J. A. 13-Physics
 Jackson, K. H.
 Spencer, M. G.

NAG 5-79 Howard University 2690
 Research relative to optical constants and properties of material in the extreme ultraviolet
Period Obligations
 06/15/80-09/30/89 FY89: TOTAL: \$368,610
Prin. Invest. NASA Tech. Officer CASE Category
 Catchings, R. M. GSFC/Osantowski, J. F. 13-Physics
 GSFC/Mangus, J. D.

NAG 5-156 Howard University 2691
 Real-time observations of X-ray diffraction patterns
Period Obligations
 07/01/81-04/30/90 FY89: \$10,000 TOTAL: \$93,625
Prin. Invest. NASA Tech. Officer CASE Category
 Tsang, T. GSFC/Yin, L. I. 13-Physics
 Chung, D. Y.

NAG 5-246 Howard University 2692
 Communications and gigabit logic systems at millimeter wave frequencies
Period Obligations
 08/15/82-12/14/87 FY89: TOTAL: \$1,184,330
Prin. Invest. NASA Tech. Officer CASE Category
 Spencer, M. G. GSFC/Burgess, A. 44-Civil Engr
 Harris, G.
 Jackson, K. H.

NAG 5-772 Howard University 2693
 Astronomical research
Period Obligations
 04/15/86-12/31/89 FY89: TOTAL: \$270,662
Prin. Invest. NASA Tech. Officer CASE Category
 Kumar, C. K. GSFC/Davila, J. M. 11-Astronomy
 Peery, B. F.

NAG 5-995 Howard University 2694
 A dynamic systems engineering methodology research study
Period Obligations
 04/15/88-12/31/89 FY89: TOTAL: \$211,637
Prin. Invest. NASA Tech. Officer CASE Category
 Gilli, T. L. GSFC/Goodson, A. 49-Engr, NEC
 Keyser, G. F.
 Paul, A. S.

NAG 5-1017 Howard University 2695
 Superconducting materials for space applications
Period Obligations
 10/15/87-02/14/90 FY89: \$275,000 TOTAL: \$525,000
Prin. Invest. NASA Tech. Officer CASE Category
 Thorpe, A. N. GSFC/Alterescu, S. 31-Atmos Sci
 Hojaji, H. GSFC/Jhabvala, M. D.
 Barkatt, A.

NASA'S UNIVERSITY PROGRAM DISTRICT OF COLUMBIA (Continued)

NAG 5-1049 Howard University 2696
Optically controlled millimeter wave devices
Period Obligations
05/15/88-11/30/89 FY89: TOTAL: \$106,274
Prin. Invest. NASA Tech. Officer CASE Category
Chowdhary, R. GSFC/Burgess, A. S. 45-Elec Engr
Wang, Y.
Leinkram, C. E.

NAG 5-1057 Howard University 2697
Glass corrosion in natural environments
Period Obligations
06/15/88-06/14/90 FY89: \$27,000 TOTAL: \$107,000
Prin. Invest. NASA Tech. Officer CASE Category
Thorpe, A. N. GSFC/Alterescu, S. 13-Physics
Barkatt, A. GSFC/O'keefe, J.

NAG 5-1127 Howard University 2698
Development of a communication gigabit logic system at millimeterwave frequencies
Period Obligations
04/01/89-03/31/90 FY89: \$337,105 TOTAL: \$337,105
Prin. Invest. NASA Tech. Officer CASE Category
Harris, G. L. GSFC/Dargo, D. 45-Elec Engr
Spencer, M. G.

NAGW 785 Howard University 2699
Photochemistry of acetylenes laboratory studies related to the photochemistry in Litam's atmosphere
Period Obligations
08/01/85-09/30/89 FY89: \$60,001 TOTAL: \$199,071
Prin. Invest. NASA Tech. Officer CASE Category
Okabe, H. HQ-EL/Bergstrahl, J. T. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NAGW 898 Howard University 2700
Integration of sea ice data on leads and polynyas obtained by multiple satellites
Period Obligations
08/01/86-08/31/89 FY89: \$2 TOTAL: \$114,102
Prin. Invest. NASA Tech. Officer CASE Category
Dey, B. HQ-U/Margolis, M. 33-Oceanography
HQ-U/Coleman, A. M.

NCA 5-107 Howard University 2701
Public service internship program
Period Obligations
06/03/86-05/31/90 FY89: \$36,000 TOTAL: \$124,062
Prin. Invest. NASA Tech. Officer CASE Category
Woodard, M. C. GSFC/Menchan, D. 99-Multi-Discip

NCC 5-25 Howard University 2702
A simulation network for electrical engineering
Period Obligations
10/01/82-11/30/89 FY89: TOTAL: \$822,268
Prin. Invest. NASA Tech. Officer CASE Category
Michal, G. M. GSFC/Truszkowski, W. F. 45-Elec Engr
Spencer, M.
Neal, W.

NGT 00-050-109 Howard University 2703
NASA graduate student researchers program
Period Obligations
09/01/86-08/31/89 FY89: TOTAL: \$53,921
Prin. Invest. NASA Tech. Officer CASE Category
Broome, T. H. HQ-LE/Owens, F. C. 46-Mech Engr

NGT 00-090-021 Howard University 2704
A summer workshop for SIMNET users
Period Obligations
08/08/88-03/31/90 FY89: \$38,509 TOTAL: \$38,509
Prin. Invest. NASA Tech. Officer CASE Category
Broome, T. H. HQ-U/Margolis, M. 49-Engr, NEC

NGT 09-011-060 Howard University 2705
NASA graduate student researchers program
Period Obligations
01/01/78-12/31/89 FY89: TOTAL: \$1,436,763
Prin. Invest. NASA Tech. Officer CASE Category
Fan, D. N. HQ-XE/McGee, A. S. 99-Multi-Discip
HQ-XE/Schwartz, E. T.

NGT 09-011-804 Howard University 2706
NASA graduate student researchers program
Period Obligations
05/01/85-05/14/89 FY89: TOTAL: \$12,000
Prin. Invest. NASA Tech. Officer CASE Category
Dey, B. HQ-LE/Owens, F. C. 32-Geological Sci

NSG 1414 Howard University 2707
The dynamics and control of large flexible space structures
Period Obligations
05/16/77-09/30/89 FY89: \$15,000 TOTAL: \$750,221
Prin. Invest. NASA Tech. Officer CASE Category
Bainum, P. M. LARC/Young, J. W. 49-Engr, NEC
Kumar, V. K.
Reddy, A. S.

NAG 5-1012 University of District of Columbia 2708
The consisting of climatological products of number 7
Period Obligations
10/01/87-12/31/89 FY89: \$43,603 TOTAL: \$93,076
Prin. Invest. NASA Tech. Officer CASE Category
Ohuria, H. GSFC/Kyle, H. L. 31-Atmos Sci

NGT 05-050-902 University of District of Columbia 2709
A Saturday academy: Engineering, mathematics and computer science for academically talented students from the metropolitan Washington area
Period Obligations
01/28/84-03/31/90 FY89: \$130,000 TOTAL: \$818,717
Prin. Invest. NASA Tech. Officer CASE Category
Coleman, W. R. HQ-U/Margolis, M. 22-Computer Science
HQ-U/Pohly, J.

FLORIDA

NCC 1-66 Embry-Riddle Aeronautical University 2710
Advanced aircraft-air traffic control (ATC) interaction (AAAI)
Period Obligations
03/01/82-02/28/90 FY89: \$47,500 TOTAL: \$374,734
Prin. Invest. NASA Tech. Officer CASE Category
Lohr, G. W. LARC/Credeur, L. 41-Aero Engr
LARC/Bergeron, H. P.

NASA'S UNIVERSITY PROGRAM
FLORIDA (Continued)

NAG 2-411 **Florida A&M University** **2711**
 Calcitonin control of calcium metabolism during weightlessness
Period *Obligations*
 09/01/86-12/31/89 FY89: TOTAL: \$127,348
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Soliman, K. F. ARC/Arnaud, S. B. 51-Biological Sci

NAG 5-738 **Florida A&M University** **2712**
 Application of the partial differential equation method in electron molecule collisions
Period *Obligations*
 02/15/86-04/14/90 FY89: \$11,642 TOTAL: \$46,455
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Weatherford, C. A. GSFC/Temkin, A. 13-Physics
 GSFC/Sullivan, E. C.

NAG10-44 **Florida A&M University** **2713**
 Computer aided engineering technology a sub task of space systems integrations and operations research application
Period *Obligations*
 09/01/87-07/31/89 FY89: TOTAL: \$18,850
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Kidd, C. KSC/Spears, J. M. 99-Multi-Discip

NAG10-51 **Florida A&M University** **2714**
 Root initiation and growth of carrots in a ground based controlled ecological life support system
Period *Obligations*
 09/30/88-10/11/89 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Pancholy, S. K. KSC/Knott, W. 99-Multi-Discip

NAS 5-25165 **Florida A&M University** **2715**
 Medical application for computer technology
Period *Obligations*
 08/15/78-12/17/88 FY89: TOTAL: \$97,317
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Fresh, F. A. GSFC/Alterescu, S. 46-Mech Engr

NCC 2-492 **Florida A&M University** **2716**
 Application and development of the Schwinger multichannel scattering theory for electronic excitation of CO and CN by electron impact
Period *Obligations*
 05/01/87-02/28/90 FY89: \$46,326 TOTAL: \$92,688
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Weatherford, C. A. ARC/Huo, W. M. 12-Chemistry

NGT 00-090-012 **Florida A&M University** **2717**
 Post-graduate education in engineering
Period *Obligations*
 05/01/88-08/31/89 FY89: TOTAL: \$85,360
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Humphries, F. S. HQ-U/Warren, L. 49-Engr, NEC
 HQ-U/Margolis, M.

NGT 00-090-015 **Florida A&M University** **2718**
 Summer bridge program the engineering concepts inshinte
Period *Obligations*
 06/21/88-06/24/90 FY89: TOTAL: \$38,055
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Toliver, W. HQ-U/Freeman, Y. B. 49-Engr, NEC
 KSC/Diggs, J. D.

NGT 10-040-900 **Florida A&M University** **2719**
 NASA graduate student researchers program
Period *Obligations*
 10/01/85-09/30/89 FY89: \$359,215 TOTAL: \$1,377,832
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Redda, K. HQ-U/Margolis, M. 59-Life Sci, NEC
 HQ-U/Freeman, Y.

NAG 1-685 **Florida Atlantic University** **2720**
 Use of energy accountancy and power flow techniques for aircraft noise transmission
Period *Obligations*
 09/01/86-12/31/89 FY89: \$64,994 TOTAL: \$199,722
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Cuschieri, J. M. LARC/Metcalf, V. L. 46-Mech Engr
 LARC/Powell, C. A.

NAG 1-715 **Florida Atlantic University** **2721**
 Theoretical models for helicopter blade wake interaction noise
Period *Obligations*
 11/10/86-11/09/89 FY89: \$34,545 TOTAL: \$89,348
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Glegg, S. A. LARC/Farassat, F. 41-Aero Engr

NAG 3-1006 **Florida Atlantic University** **2722**
 A simplified performance simulation of the Space Shuttle main engine using multivariable system identification techniques
Period *Obligations*
 02/08/89-02/07/90 FY89: \$50,305 TOTAL: \$50,305
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Duyar, A. LERC/Marrill, W. C. 46-Mech Engr

NAGW 989 **Florida Atlantic University** **2723**
 Ground based column abundance of measurements of atmospheric hydroxyl from 7 n 40 n and 65 n
Period *Obligations*
 12/01/86-03/31/90 FY89: \$30,000 TOTAL: \$74,769
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Burnett, C. R. HQ-EE/Margitan, J. J. 31-Atmos Sci
 HQ-EE/Watson, R. T.

NAS10-11569 **Florida Atlantic University** **2724**
 Self-sealing tube fittings for cryogenic applications
Period *Obligations*
 03/16/89-03/15/90 FY89: \$71,408 TOTAL: \$71,408
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Chow, W. KSC/Lin, F. N. 43-Chem Engr
 Moslemian, D.

NAS10-11574 **Florida Atlantic University** **2725**
 Efficiency of the ADA implementations extract data to prove their usefulness for space station
Period *Obligations*
 08/01/89-07/31/90 FY89: \$47,726 TOTAL: \$47,726
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Smith, D. KSC/Mac dowell, L. 33-Oceanography
 KSC/Springfield, C.

NAG 8-109 **Florida Institute of Technology** **2726**
 A new and computationally rapid solution method for conduction radiation fin analysis
Period *Obligations*
 06/15/88-06/14/89 FY89: TOTAL: \$41,503
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Frankel, J. I. MSFC/Gill, U. S. 46-Mech Engr
 MSFC/Patterson, W. C.

NASA'S UNIVERSITY PROGRAM **FLORIDA (Continued)**

NAG 8-781 **Florida Institute of Technology** **2727**
Improvement of program to calculate electronic properties of narrow band gap materials
Period *Obligations*
06/15/89-06/14/90 FY89: \$31,022 TOTAL: \$31,022
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Patterson, J. D. MSFC/Lehoczky, S. L. 13-Physics
MSFC/Perry, G. L.

NAG10-37 **Florida Institute of Technology** **2728**
Phase 1 general purpose end effector
Period *Obligations*
04/28/87-10/28/87 FY89: TOTAL: \$24,657
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Dilpare, A. L. KSC/Littlefield, M. 99-Multi-Discip

NAG10-60 **Florida Institute of Technology** **2729**
Hydrogen by product from production of SRB ammonium perchlorate
Period *Obligations*
06/15/89-12/14/89 FY89: \$34,000 TOTAL: \$34,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Thomas, J. J. KSC/Nicholson, L. 12-Chemistry

NAS10-11595 **Florida Institute of Technology** **2730**
Efficiency of the ADA implementation
Period *Obligations*
06/23/89-09/22/89 FY89: \$37,601 TOTAL: \$37,601
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Anger, F. D. KSC/Brook, O. 99-Multi-Discip
Rodriguez, R. V.

NAG 1-421 **Florida State University** **2731**
Computation of large turbulence structures and noise of supersonic jets
Period *Obligations*
12/15/83-12/31/89 FY89: \$60,000 TOTAL: \$340,962
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Tam, C. K. LARC/Seiner, J. M. 41-Aero Engr
LARC/Norum, T. D.

NAG 1-862 **Florida State University** **2732**
Spectral solution of discontinuous hyperbolic problems
Period *Obligations*
05/08/88-05/07/90 FY89: \$30,689 TOTAL: \$68,777
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Kopriva, D. A. LARC/Zang, T. A. 41-Aero Engr
LARC/Kumar, A.

NAG 2-314 **Florida State University** **2733**
The development of laser speckle velocimetry for the study of vortical flows
Period *Obligations*
10/01/84-12/31/89 FY89: \$64,863 TOTAL: \$363,023
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Krothapalli, A. ARC/Dunagan, S. E. 41-Aero Engr
Lourenco, L. M. ARC/Signor, D. B.
Dommelen, L. V.

NAG 5-764 **Florida State University** **2734**
Relating multitemporal meteorological satellite data to climatological data from Africa
Period *Obligations*
04/01/86-09/30/90 FY89: \$40,000 TOTAL: \$169,225
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Nicholson, S. E. GSFC/Holben, B. N. 39-Env Sci, NEC
Tucker, C. J.

NAG 5-815 **Florida State University** **2735**
Prognostic studies of wave mean flow and wave flow interactions
Period *Obligations*
07/15/86-08/15/90 FY89: \$64,714 TOTAL: \$296,714
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Pfeffer, R. L. GSFC/Helfand, M. 31-Atmos Sci

NAG 5-849 **Florida State University** **2736**
Interannual variation of the net radiation balance over the western Sahara and sub Sahara
Period *Obligations*
10/01/86-01/31/90 FY89: \$40,000 TOTAL: \$226,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Smith, E. A. GSFC/Oseroff, H. 19-Phys Sci, NEC

NAG 5-891 **Florida State University** **2737**
Retrieval of surface fluxes from a combination of satellite and surface platforms
Period *Obligations*
04/15/87-01/31/90 FY89: \$96,558 TOTAL: \$248,558
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Smith, E. A. GSFC/Choudhury, B. 39-Env Sci, NEC
GSFC/Hall, F.

NAG 5-1070 **Florida State University** **2738**
Numerical solution of the geoelectrodynamical problem
Period *Obligations*
10/15/88-12/31/89 FY89: \$83,000 TOTAL: \$83,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Cain, J. C. GSFC/Langel, R. A. 32-Geological Sci

NAG 8-33 **Florida State University** **2739**
Analysis and use of VAS satellite data
Period *Obligations*
08/23/85-08/23/88 FY89: TOTAL: \$155,796
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Fuelberg, H. E. MSFC/Greene, W. M. 31-Atmos Sci
MSFC/Smith, G. T.

NAG 8-631 **Florida State University** **2740**
Analysis of space field program data
Period *Obligations*
06/01/87-05/31/89 FY89: TOTAL: \$159,545
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Ray, P. MSFC/Robertson, F. R. 31-Atmos Sci
MSFC/Blakeslee, R. J.

NAG 8-653 **Florida State University** **2741**
An evaluation of satellite derived humidity and its relationship to convective development
Period *Obligations*
12/01/87-11/30/89 FY89: \$92,269 TOTAL: \$182,266
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Fuelberg, H. MSFC/Christain, H. J. 31-Atmos Sci
MSFC/Wilson, G. S.

NAG 8-760 **Florida State University** **2742**
Potential vorticity index
Period *Obligations*
01/19/89-01/18/90 FY89: \$61,000 TOTAL: \$61,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Barclon, A. MSFC/Miller, T. L. 31-Atmos Sci
Weng, H. MSFC/Kaufman, J. W.

NASA'S UNIVERSITY PROGRAM
FLORIDA (Continued)

NAG 8-761	Florida State University	2743
Tropical analysis and prediction impact study from lidar atmospheric wind sounder		
<i>Period</i>	<i>Obligations</i>	
01/20/89-02/16/90	FY89: \$75,570	TOTAL: \$75,570
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Krishnamurti, T. N.	MSFC/Fitzjarrald, D.	31-Atmos Sci
NAGW 985	Florida State University	2744
Data assimilation in ocean circulation models using space acquired in situ observations		
<i>Period</i>	<i>Obligations</i>	
11/01/86-10/31/89	FY89: \$65,000	TOTAL: \$324,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
O'Brien, J. J.	HQ-EE/Lagerloef, G. S.	33-Oceanography
	HQ-EE/Wilson, W. S.	
NAGW 991	Florida State University	2745
Sophisticated mathematical modeling of microwave radiative transfer through a simulated evolving cloud including snow rain ice and water vapor		
<i>Period</i>	<i>Obligations</i>	
01/01/87-06/30/90	FY89: \$191,686	TOTAL: \$307,686
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Smith, E. A.	HQ-EE/Dodge, J. C.	31-Atmos Sci
	HQ-EE/Tuyahov, A.	
NAGW 1656	Florida State University	2746
Dust plasma interaction		
<i>Period</i>	<i>Obligations</i>	
03/01/89-02/28/90	FY89: \$40,538	TOTAL: \$40,538
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Horanyi, M.	HQ-ES/Mellott, M. M.	13-Physics
	HQ-ES/Perry, T. W.	
NAGW 1823	Florida State University	2747
Carbon and hydrogen isotopic composition of methane emitted from subtropical to arctic wetlands: 1) controls on spatial and temporal variations; 2) modification by dominant macrophytes		
<i>Period</i>	<i>Obligations</i>	
07/01/89-12/31/89	FY89: \$28,862	TOTAL: \$28,862
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Chanton, J. P.	HQ-EE/Kurylo, M. J.	33-Oceanography
	HQ-EE/Watson, R. T.	
NAG10-47	Florida State University	2748
The application of VAS satellite imagery to thunderstorm forecasting at Cape Canaveral		
<i>Period</i>	<i>Obligations</i>	
08/01/88-07/31/90	FY89: \$54,993	TOTAL: \$109,984
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Fuelberg, H. E.	KSC/Nicholson, J. R.	31-Atmos Sci
NGT 00-050-042	Florida State University	2749
NASA graduate student researchers program		
<i>Period</i>	<i>Obligations</i>	
08/07/86-06/08/89	FY89:	TOTAL: \$54,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Iverson, R. L.	HQ-LE/Owens, F. C.	33-Oceanography
NGT 00-050-058	Florida State University	2750
NASA graduate student researchers program		
<i>Period</i>	<i>Obligations</i>	
08/01/86-07/31/90	FY89: \$1,799	TOTAL: \$55,799
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Barclon, A.	HQ-LE/Owens, F. C.	11-Astronomy
NGT 00-050-437	Florida State University	2751
NASA graduate student researchers program		
<i>Period</i>	<i>Obligations</i>	
09/01/89-08/31/90	FY89: \$18,000	TOTAL: \$18,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Carney, T. A.	HQ-XE/Owens, F. C.	19-Phys Sci, NEC
NGT 00-050-475	Florida State University	2752
NASA graduate student researchers program		
<i>Period</i>	<i>Obligations</i>	
08/01/89-07/31/90	FY89: \$18,000	TOTAL: \$18,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Nicholson, S. E.	HQ-XE/Owens, F. C.	19-Phys Sci, NEC
NGT 00-050-484	Florida State University	2753
NASA graduate student researchers program		
<i>Period</i>	<i>Obligations</i>	
08/28/89-08/27/90	FY89: \$18,000	TOTAL: \$18,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
O'Brien, J. J.	HQ-XE/Owens, F. C.	19-Phys Sci, NEC
NGT 00-050-524	Florida State University	2754
NASA graduate student researchers program		
<i>Period</i>	<i>Obligations</i>	
08/01/89-07/31/90	FY89: \$18,000	TOTAL: \$18,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Fuelberg, H. E.	HQ-XE/Owens, F. C.	31-Atmos Sci
NGT 00-070-062	Florida State University	2755
Graduate student researchers underrepresented minority focus program		
<i>Period</i>	<i>Obligations</i>	
10/01/87-07/31/90	FY89: \$22,472	TOTAL: \$40,472
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Nicholson, S. E.	HQ-XE/Owens, F. C.	31-Atmos Sci
NGT 00-070-095	Florida State University	2756
NASA graduate student researchers underrepresented minority focus program		
<i>Period</i>	<i>Obligations</i>	
08/15/88-08/14/90	FY89: \$18,000	TOTAL: \$36,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Fuelberg, H. E.	HQ-XE/Owens, F. C.	33-Oceanography
NGT 10-004-800	Florida State University	2757
NASA graduate student training program in oceanogr remote sensing		
<i>Period</i>	<i>Obligations</i>	
06/01/81-05/31/90	FY89:	TOTAL: \$793,464
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
O'Brien, J. J.	HQ-EE/Thomas, R. H.	33-Oceanography
Mach, W. H.	HQ-EE/Wilson, W. S.	
NSG 7337	Florida State University	2758
Rock-inhabiting microorganisms from hot and cold deserts: Adaptations to extreme environments		
<i>Period</i>	<i>Obligations</i>	
03/15/77-10/14/89	FY89: \$146,153	TOTAL: \$1,261,366
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Friedmann, E. I.	HQ-EB/Rummel, J. D.	51-Biological Sci
Friedmann, R. O.	HQ-EB/Averner, M.	

**NASA'S UNIVERSITY PROGRAM
FLORIDA (Continued)**

NAG10-42 The University of Central Florida 2759
Automation knowledge generation
Period Obligations
08/17/87-08/17/90 FY89: \$160,791 TOTAL: \$456,095
Prin. Invest. NASA Tech. Officer CASE Category
Gonzales, A. KSC/Belton, C. 99-Multi-Discip

NAG10-43 The University of Central Florida 2760
Expert systems applications educational project
Period Obligations
08/10/87-08/10/88 FY89: TOTAL: \$31,023
Prin. Invest. NASA Tech. Officer CASE Category
Gonzalez, A. J. KSC/David, T. C. 99-Multi-Discip

NAG10-58 The University of Central Florida 2761
Knowledge acquisition for artificial intelligence productivity and materials analysis techniques
Period Obligations
05/09/89-11/04/89 FY89: \$273,509 TOTAL: \$273,509
Prin. Invest. NASA Tech. Officer CASE Category
Rice, S. L. KSC/Davis, T. 99-Multi-Discip

NAS10-11351 The University of Central Florida 2762
Heat pipe application for increase dehydration for air condition systems
Period Obligations
11/17/86-03/31/89 FY89: TOTAL: \$59,312
Prin. Invest. NASA Tech. Officer CASE Category
Khaltar, M. K. KSC/Boggs, W. 99-Multi-Discip

NAS10-11385 The University of Central Florida 2763
Unique application of heat pipes to increase dehumidification performance of air conditioning systems
Period Obligations
03/09/87-01/31/90 FY89: \$39,720 TOTAL: \$83,320
Prin. Invest. NASA Tech. Officer CASE Category
Khattar, M. KSC/O'malley, J. K. 99-Multi-Discip

NGT 00-050-390 The University of Central Florida 2764
NASA graduate student researchers program
Period Obligations
09/06/88-09/05/90 FY89: TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Bishop, P. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 00-060-002 The University of Central Florida 2765
NASA summer faculty fellowship program in research
Period Obligations
01/01/88-03/31/90 FY89: \$175,030 TOTAL: \$388,885
Prin. Invest. NASA Tech. Officer CASE Category
Hosler, E. R. HQ-XE/McGee, A. S. 49-Engr, NEC
HQ-XE/Schwartz, E. T.

NAG 1-609 University of Florida 2766
Investigation of temperature and concentration oscillations in the directional solidification of PbSnTe
Period Obligations
08/01/85-12/31/89 FY89: \$36,658 TOTAL: \$296,639
Prin. Invest. NASA Tech. Officer CASE Category
Anderson, T. J. LARC/Fripp, A. L. 13-Physics
Narayanan, R.

NAG 1-671 University of Florida 2767
Generation of an energetic oxygen atom beam using electron stimulated desorption
Period Obligations
04/01/86-03/31/90 FY89: \$24,999 TOTAL: \$115,068
Prin. Invest. NASA Tech. Officer CASE Category
Hofflund, G. B. LARC/Outlaw, R. A. 47-Materials Engr
LARC/Meador, W. E.

NAG 1-737 University of Florida 2768
Analytical study of gasdynamic mixing lasers
Period Obligations
02/01/87-01/31/90 FY89: TOTAL: \$32,356
Prin. Invest. NASA Tech. Officer CASE Category
Chen, K. Y. LARC/Deyoung, R. J. 13-Physics
LARC/Conway, E. J.

NAG 1-794 University of Florida 2769
Development of a high performance carbon oxygen oxidation catalyst for use in CO2 lasers
Period Obligations
07/17/87-09/30/90 FY89: \$100,016 TOTAL: \$192,516
Prin. Invest. NASA Tech. Officer CASE Category
Hofflund LARC/Schryer, D. R. 43-Chem Engr
LARC/Hess, R. V.

NAG 1-826 University of Florida 2770
Impact response and damage in three dimensional braided graphite fiber composites
Period Obligations
11/01/87-10/31/89 FY89: \$41,092 TOTAL: \$106,580
Prin. Invest. NASA Tech. Officer CASE Category
Sankar, B. V. LARC/Poe, C. C. 47-Materials Engr
LARC/Harris, C. E.

NAG 1-850 University of Florida 2771
Multilevel decomposition in the context of global sensitivity analysis
Period Obligations
02/02/88-07/15/89 FY89: TOTAL: \$7,999
Prin. Invest. NASA Tech. Officer CASE Category
Hajela, P. LARC/Sobieski, J. 41-Aero Engr

NAG 1-1004 University of Florida 2772
Decomposition methods for large scale optimum synthesis
Period Obligations
06/08/89-06/07/90 FY89: \$18,213 TOTAL: \$18,213
Prin. Invest. NASA Tech. Officer CASE Category
Hajela, P. LARC/Sobieski, J. 41 Aero Engr

NAG 1-1017 University of Florida 2773
Sensor actuator dynamics in the active control of flexible structures
Period Obligations
08/11/89-08/10/91 FY89: \$124,934 TOTAL: \$124,934
Prin. Invest. NASA Tech. Officer CASE Category
Zimmerman, D. C. LARC/Nimmo, N. A. 46-Mech Engr

NAG 2-473 University of Florida 2774
Development of solution adaptive computational methods for complex flow problems of propan transport
Period Obligations
09/01/87-01/31/90 FY89: \$60,864 TOTAL: \$110,719
Prin. Invest. NASA Tech. Officer CASE Category
Hsu, C. C. ARC/Chyu, W. J. 41-Aero Engr
Shiau, N. H. ARC/Bencze, D. P.

**NASA'S UNIVERSITY PROGRAM
FLORIDA (Continued)**

NAG 3-363 University of Florida 2775
Numerical study of fluid flow, heat transfer and combustion processes inside the combustion chamber of a direct-injection-stratified-charge rotary engine

Period	Obligations	
01/01/83-12/30/88	FY89:	TOTAL: \$344,954
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Shih, T. I.	LERC/Schock, H. J.	46-Mech Engr
	LERC/Nguyen, L.	

NAGW 1257 University of Florida 2783
Criteria for trajectory based parent daughter inference in support of dust collection instrumentation on the space station

Period	Obligations	
01/01/88-10/31/89	FY89: \$55,798	TOTAL: \$124,828
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Gustafson, B. A.	HQ-EL/Mahaffy, P.	11-Astronomy
	HQ-EL/Quaide, W. L.	

NAG 3-828 University of Florida 2776
Flow fields inside compressor and turbine components of gas turbine engine

Period	Obligations	
10/28/87-10/27/88	FY89:	TOTAL: \$60,240
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Shih, T. I.	LERC/Roelke, R. J.	41-Aero Engr
	LERC/Moore, R. D.	

NAGW 1289 University of Florida 2784
Giotto data analysis renewal proposal for the Halley optical probe experiment

Period	Obligations	
05/01/88-04/30/90	FY89: \$22,000	TOTAL: \$90,743
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Giovane, F.	HQ-EL/Bergstrahl, J. T.	11-Astronomy
	HQ-EL/Quaide, W. L.	

NAG 3-874 University of Florida 2777
Wave formation in a non-Newtonian fluid used for deicing

Period	Obligations	
02/25/88-05/31/89	FY89:	TOTAL: \$37,500
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Yih, C. S.	LERC/Reinmann, J. J.	41-Aero Engr

NAGW 1821 University of Florida 2785
A study of gometary dust using IRAS observations

Period	Obligations	
09/01/89-08/31/90	FY89: \$29,832	TOTAL: \$29,832
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Campins, H.	HQ-EL/Quaide, W.	19-Phys Sci, NEC

NAG 3-911 University of Florida 2778
Penetration, mixing and combustion of jets injected into supersonic streams

Period	Obligations	
06/15/88-12/14/88	FY89:	TOTAL: \$6,926
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
P-shih, T. I.	LERC/Nguyen, H. L.	46-Mech Engr

NAGW 1832 University of Florida 2786
Dynamics of the uranian satellites

Period	Obligations	
09/01/89-08/31/90	FY89: \$44,346	TOTAL: \$44,346
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Dermott, S. F.	HQ-EL/Quaide, W. L.	19-Phys Sci, NEC

NAG 5-773 University of Florida 2779
Low frequency radio emission from data planet magnetospheres

Period	Obligations	
05/01/86-05/31/90	FY89: \$36,000	TOTAL: \$130,332
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Carr, T. D.	GSFC/Kaiser, M. L.	11-Astronomy
	GSFC/Desih, M. D.	

NAG10-41 University of Florida 2787
Clinical practice library of medicine content expansion with datafile enhancements for color graphics materials

Period	Obligations	
03/09/87-03/06/90	FY89: \$168,000	TOTAL: \$505,029
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Grams, R. R.	KSC/Koller, A.	56-Medical Sciences

NAG 5-1290 University of Florida 2780
Feasibility study of modification of the gamma ray advanced detector (GRAD) spectrometer for use in joint American/Soviet balloon flight in Antarctica

Period	Obligations	
10/01/89-09/30/90	FY89: \$15,000	TOTAL: \$15,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Rester, A. C.	GSFC/Trombka, J. I.	19-Phys Sci, NEC
	GSFC/Floyd, S. R.	

NAG10-48 University of Florida 2788
Microbiological wastewater conversion system

Period	Obligations	
08/02/88-01/01/90	FY89:	TOTAL: \$56,108
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Koopman, B.	KSC/Williams, P.	99-Multi-Discip

NAG 9-91 University of Florida 2781
Evolution of an Archean continental margin

Period	Obligations	
07/01/84-07/01/90	FY89: \$39,500	TOTAL: \$109,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Mueller, P. A.	JSC/Browne, I. D.	32-Geological Sci

NAG10-49 University of Florida 2789
Location and characterization of lightning at the Kennedy Space Center

Period	Obligations	
07/01/88-01/31/90	FY89: \$146,143	TOTAL: \$146,143
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Thomson, E. M.	KSC/Jafferis, W.	31-Atmos Sci

NAGW 1153 University of Florida 2782
A VHF lightning discharge source location system

Period	Obligations	
08/01/87-02/29/88	FY89:	TOTAL: \$59,940
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Uman, M. A.	HQ-EE/Dodge, J. C.	31-Atmos Sci
	HQ-EE/Kakar, R. K.	

NAS 2-9976 University of Florida 2790
Experiment implementation of a lightning and radio emission detector

Period	Obligations	
05/31/78-12/31/89	FY89:	TOTAL: \$135,513
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Lanzerotti, L. J.	ARC/Wilhelmi, A. J.	31-Atmos Sci
Uman, M. A.	ARC/Tischler, E. T.	

**NASA'S UNIVERSITY PROGRAM
FLORIDA (Continued)**

NASW 3578 University of Florida 2791
Halley optical probe experiment (HOPE)
Period Obligations
10/01/83-01/31/88 FY89: TOTAL: \$929,835
Prin. Invest. NASA Tech. Officer CASE Category
Weinberg, J. HQ-EL/Brunk, W. E. 11-Astronomy
HQ-EL/Brinton, H. C.

NASW 4183 University of Florida 2792
Operation of an industrial applications center
Period Obligations
07/01/86-06/30/90 FY89: \$428,800 TOTAL: \$1,594,669
Prin. Invest. NASA Tech. Officer CASE Category
Thornton, J. R. HQ/Kahn, A. B. 99-Multi-Discip

NAS10-11481 University of Florida 2793
Portable instrument using microwaves for Space Shuttle tile moisture detection
Period Obligations
03/09/88-06/09/89 FY89: TOTAL: \$82,105
Prin. Invest. NASA Tech. Officer CASE Category
Farber, E. A. KSC/Davis, L. 99-Multi-Discip

NAS10-11495 University of Florida 2794
Medical support for Space Shuttle launches and landing at Kennedy Space Center
Period Obligations
09/28/88-09/27/91 FY89: \$26,925 TOTAL: \$40,638
Prin. Invest. NASA Tech. Officer CASE Category
Melker, R. J. KSC/Long, I. D. 56-Medical Sciences

NCA 2-214 University of Florida 2795
Vortex breakdown
Period Obligations
05/11/87-12/31/88 FY89: TOTAL: \$5,174
Prin. Invest. NASA Tech. Officer CASE Category
Clarkson, M. H. ARC/Chapman, G. T. 41-Aero Engr

NCA 2-325 University of Florida 2796
Application of the weighted central overlap reduction technique to astrometric telescope facility data
Period Obligations
07/01/88-10/31/88 FY89: TOTAL: \$12,860
Prin. Invest. NASA Tech. Officer CASE Category
Eichhorn, H. K. ARC/Scargle, J. D. 11-Astronomy

NCC 1-132 University of Florida 2797
A menu driven graphical analysis system for examining aerodynamics data
Period Obligations
09/30/88-09/29/89 FY89: \$22,036 TOTAL: \$22,036
Prin. Invest. NASA Tech. Officer CASE Category
Fearn, R. L. LARC/Weston, R. P. 41-Aero Engr
Wright, J.

NCC 2-403 University of Florida 2798
A study of the roll up of the vortex pair associated with a jet in a crossflow
Period Obligations
08/01/86-01/31/89 FY89: TOTAL: \$75,652
Prin. Invest. NASA Tech. Officer CASE Category
Fearn, R. L. ARC/Aoyagi, K. 41-Aero Engr
Roth, K. R. ARC/Koenig, D. G.

NGT 00-070-021 University of Florida 2799
Graduate student researchers underrepresented minority focus program
Period Obligations
05/15/87-05/14/88 FY89: TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Grams, R. HQ-XE/Owens, F. C. 22-Computer Science

NGT 00-070-022 University of Florida 2800
Graduate student researchers underrepresented minority focus program
Period Obligations
05/15/87-05/14/88 FY89: TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Grams, R. HQ-XE/Owens, F. C. 22-Computer Science

NGT 00-070-064 University of Florida 2801
Graduate student researchers underrepresented minority focus program
Period Obligations
10/01/87-09/30/89 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Hoflund, G. B. HQ-XE/Owens, F. C. 43-Chem Engr

NSG 7236 University of Florida 2802
Use of remote sensing in solving Florida's geological and coastal engineering problems
Period Obligations
07/01/76-12/31/88 FY89: TOTAL: \$760,000
Prin. Invest. NASA Tech. Officer CASE Category
Ruth, B. E. HQ-EL/Uyahov, J. T. 39-Env Sci, NEC
Degner, J. D.

NAG 1-918 University of Miami 2803
Low level measurements of atmospheric dimethylsulfide dms hydrogen sulfide H s and sulfur dioxide so for global tropospheric experiment GTE chemical instrumentation test and
Period Obligations
11/01/88-10/31/90 FY89: \$179,922 TOTAL: \$179,922
Prin. Invest. NASA Tech. Officer CASE Category
Saltzman, E. S. LARC/Drewry, J. W. 31-Atmos Sci
Cooper, D. J. LARC/Hoell, J. M.

NAG 5-414 University of Miami 2804
Continental and oceanic crustal magnetization investigations
Period Obligations
04/01/84-12/31/89 FY89: TOTAL: \$280,850
Prin. Invest. NASA Tech. Officer CASE Category
Harrison, C. G. GSFC/Welker, J. E. 32-Geological Sci
GSFC/Allenby, R. J.

NAG 5-741 University of Miami 2805
Estimation of present day plate motions using satellite laser ranging results
Period Obligations
03/01/86-10/31/89 FY89: TOTAL: \$107,181
Prin. Invest. NASA Tech. Officer CASE Category
Harrison, C. G. GSFC/Frey, H. V. 32-Geological Sci

NAG 8-621 University of Miami 2806
Aerosol measurements over the Pacific Ocean in support of the IR aerosol backscatter program
Period Obligations
01/26/87-01/26/90 FY89: \$80,968 TOTAL: \$254,820
Prin. Invest. NASA Tech. Officer CASE Category
Prospero, J. M. MSFC/Fitzjarrald, D. E. 31-Atmos Sci
Savoie, D. L.

**NASA'S UNIVERSITY PROGRAM
FLORIDA (Continued)**

NAG 8-656 University of Miami 2807
The effect of latent heat release on synoptic to planetary wave interactions and its implications for satellite observations
Period Obligations
07/15/87-07/29/90 FY89: \$64,000 TOTAL: \$180,000
Prin. Invest. NASA Tech. Officer CASE Category
Branscome, L. MSFC/Miller, T. 41-Aero Engr

NAS 5-30694 University of Miami 2815
Maintenance and operation of the application technology satellite ATS-3 communication system
Period Obligations
05/23/89-05/23/90 FY89: \$105,759 TOTAL: \$105,759
Prin. Invest. NASA Tech. Officer CASE Category
Brown, O. GSFC/Wales, R. 49-Engr, NEC

NAGW 273 University of Miami 2808
An investigation of the utility of ocean color imagery for delineation of oceanic processes in the western North Atlantic
Period Obligations
11/01/81-01/31/90 FY89: \$259,991 TOTAL: \$1,481,648
Prin. Invest. NASA Tech. Officer CASE Category
Brown, O. B. HQ-EE/Lewis, M. R. 33-Oceanography
Evans, R. H. HQ-EB/Wilson, W. S.

NCA 2-441 University of Miami 2816
Intervention strategies for human error in transport aircraft
Period Obligations
08/15/89-08/14/90 FY89: \$39,953 TOTAL: \$39,953
Prin. Invest. NASA Tech. Officer CASE Category
Wiener, E. L. ARC/Norman, S. D. 62-Social Aspects

NAGW 1291 University of Miami 2809
Evaluation of satellite primary production algorithms
Period Obligations
03/01/88-12/31/89 FY89: \$99,941 TOTAL: \$199,725
Prin. Invest. NASA Tech. Officer CASE Category
Balch, W. M. HQ-EE/Lewis, M. R. 33-Oceanography
HQ-EE/Wilson, W. S.

NCC 2-377 University of Miami 2817
Error analysis and prevention in highly automated transport aircraft
Period Obligations
10/01/85-06/30/89 FY89: TOTAL: \$334,173
Prin. Invest. NASA Tech. Officer CASE Category
Wiener, E. ARC/Palmer, E. 69-Psych, NEC
ARC/Remington, R.

NAGW 1678 University of Miami 2810
Tectonics of central and southern Mexico using LANDSAT thematic mapper data
Period Obligations
02/01/89-01/31/90 FY89: \$20,303 TOTAL: \$20,303
Prin. Invest. NASA Tech. Officer CASE Category
Harrison, C. G. HQ-EE/Baltuck, M. 32-Geological Sci
HQ-EE/Ruzek, M. R.

NCC 2-524 University of Miami 2818
Cockpit automation and social processes their joint effect on performance and safety
Period Obligations
01/01/88-12/31/88 FY89: \$30,000 TOTAL: \$72,000
Prin. Invest. NASA Tech. Officer CASE Category
Wiener, E. L. ARC/Foushee, H. C. 62-Social Aspects
Curry, R. E. ARC/Palmer, E. A.

NAS 5-28745 University of Miami 2811
Northern Venezuelan structural geology from LANDSAT 5 thematic mapper data
Period Obligations
07/30/85-02/28/89 FY89: TOTAL: \$201,714
Prin. Invest. NASA Tech. Officer CASE Category
Harrison, C. G. GSFC/Oseroff, H. 32-Geological Sci

NCC 2-581 University of Miami 2819
Cockpit automation and group processes
Period Obligations
01/01/89-12/31/89 FY89: \$164,223 TOTAL: \$164,223
Prin. Invest. NASA Tech. Officer CASE Category
Wiener, E. L. ARC/Foushee, H. C. 62-Social Aspects
Curry, R. E. ARC/Palmer, E. A.

NAS 5-29338 University of Miami 2812
Maintenance and operation of the application technology satellite (ATS-3) communication system
Period Obligations
04/01/86-04/30/89 FY89: TOTAL: \$261,601
Prin. Invest. NASA Tech. Officer CASE Category
Brown, O. GSFC/Wales, R. 49-Engr, NEC

NGR 10-007-008 University of Miami 2820
Research in the Institute of Molecular Evolution in the School of Environmental and Planetary Sciences
Period Obligations
06/09/64-09/30/89 FY89: \$55,765 TOTAL: \$3,268,425
Prin. Invest. NASA Tech. Officer CASE Category
Fox, S. W. HQ-EB/Rummel, J. D. 12-Chemistry
HQ-EB/Averner, M.

NAS 5-29352 University of Miami 2813
Acquisition and installation of the RSMAS satellite data analysis system
Period Obligations
06/24/86-09/23/90 FY89: \$117,407 TOTAL: \$669,039
Prin. Invest. NASA Tech. Officer CASE Category
Evans, R. GSFC/Oakes, A. 33-Oceanography
Brown, O. GSFC/Wolford, G.

NGT 00-070-010 University of Miami 2821
Graduate student researchers underrepresented minority focus program
Period Obligations
01/01/87-12/31/89 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Harrison, C. A. HQ-XE/Owens, F. C. 32-Geological Sci

NAS 5-30557 University of Miami 2814
EOS interdisciplinary study
Period Obligations
07/24/89-12/14/90 FY89: \$30,000 TOTAL: \$30,000
Prin. Invest. NASA Tech. Officer CASE Category
Brown, O. B. GSFC/Soffen, G. 33-Oceanography

NAG 1-632 University of South Florida 2822
Intelligent software systems for robotics research
Period Obligations
05/01/86-04/30/90 FY89: \$43,717 TOTAL: \$134,723
Prin. Invest. NASA Tech. Officer CASE Category
Varanasi, M. R. LARC/Goode, P. W. 29-Math/Computer, NEC
Mehrotra, R. LARC/Cornils, K.

**NASA'S UNIVERSITY PROGRAM
FLORIDA (Continued)**

NAG 2-487 University of South Florida 2823
Architectures for reasoning in parallel
Period *Obligations*
11/01/87-12/31/89 FY89: \$25,745 TOTAL: \$42,896
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hall, L. O. ARC/Lim, R. S. 22-Computer Science
ARC/Galant, D. C.

NAG 3-851 University of South Florida 2824
Advanced solar dynamic heat receiver program development and design optimization
Period *Obligations*
01/05/88-12/31/89 FY89: \$70,000 TOTAL: \$123,138
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Crane, R. A. LERC/Dustin, M. O. 46-Mech Engr
LERC/Kohout, L. L.

NAGW 465 University of South Florida 2825
Development of in-site sensors to complement ocean color remote sensing
Period *Obligations*
03/01/83-12/31/89 FY89: \$135,132 TOTAL: \$838,490
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Carder, K. L. HQ-EE/Lewis, M. R. 33-Oceanography
HQ-EE/Wilson, W. S.

NAGW 678 University of South Florida 2826
Simulation analysis of nonstationary CZCS series from continental shelves
Period *Obligations*
12/01/84-11/30/89 FY89: \$260,000 TOTAL: \$1,317,353
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Carder, K. L. HQ-EE/Lewis, M. R. 33-Oceanography
Walsh, J. J. HQ-EE/Wilson, W. S.
Brown, O. B.

NAGW 836 University of South Florida 2827
Biogenic methane: Fluxes and isotopic composition from warm wetland environments
Period *Obligations*
10/01/85-03/31/89 FY89: \$18,081 TOTAL: \$270,374
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Sackett, W. M. HQ-EE/Kurylo, M. J. 39-Env Sci, NEC
HQ-EE/Watson, R. T.

NAGW 1173 University of South Florida 2828
Global biogeography
Period *Obligations*
08/01/87-07/31/89 FY89: TOTAL: \$93,177
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Briggs, J. C. HQ-EB/Rummel, J. D. 51-Biological Sci

NCC 2-580 University of South Florida 2829
Efficient computational methods to study new innovative signal detection techniques in seti
Period *Obligations*
11/01/88-10/31/89 FY89: \$21,000 TOTAL: \$21,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Deans, S. R. ARC/Jones, H. W. 21-Mathematics
ARC/Oliver, B. M.

NGT 00-070-110 University of South Florida 2830
NASA graduate student researchers underrepresented minority focus program
Period *Obligations*
01/01/89-12/31/89 FY89: \$17,000 TOTAL: \$17,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hall, L. O. HQ-XE/Owens, F. C. 49-Engr, NEC

GEORGIA

NAG 1-410 Atlanta University 2831
Construction of finite difference schemes having special properties for ordinary and partial differential equations
Period *Obligations*
10/01/83-12/31/89 FY89: \$74,150 TOTAL: \$629,323
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Mickens, R. E. LARC/Shoosmith, J. N. 21-Mathematics

NAG 1-412 Atlanta University 2832
Hybrid pattern recognition approaches to image analysis and feature detection in digitized images
Period *Obligations*
10/01/83-10/31/89 FY89: TOTAL: \$550,151
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Warsi, N. A. LARC/Goode, P. W. 29-Math/Computer, NEC

NAG 3-113 Atlanta University 2833
Design and implementation of a networked automated laboratory
Period *Obligations*
10/20/80-06/30/89 FY89: TOTAL: \$496,522
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Reed, J. L. LERC/Charleston, J. A. 19-Phys Sci, NEC
LERC/O'donnell, P. M.

NAG 3-777 Atlanta University 2834
Theoretical investigation of amorphous silicon systems
Period *Obligations*
02/01/87-01/29/90 FY89: \$35,000 TOTAL: \$105,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Neal, H. L. LERC/Flood, D. J. 13-Physics
LERC/Good, B. L.

NGT 00-050-106 Atlanta University 2835
NASA graduate student researchers program
Period *Obligations*
08/15/86-08/14/89 FY89: TOTAL: \$54,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Warsi, N. A. HQ-LE/Owens, F. C. 22-Computer Science

NAGW 1544 Emory University 2836
Laser study of kinetic processes
Period *Obligations*
12/01/88-11/30/89 FY89: \$49,986 TOTAL: \$49,986
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lin, M. C. HQ-EL/Bergstrahl, J. T. 31-Atmos Sci

NASA'S UNIVERSITY PROGRAM
GEORGIA (Continued)

NAS 2-10527 Emory University 2837
 Cardiovascular adaptation of white rats to decreased gravity of Space Shuttle/Spacelab inflight conditions

Period	Obligations
01/17/80-12/31/90	FY89: \$235,023 TOTAL: \$1,294,024
Prin. Invest.	NASA Tech. Officer CASE Category
Popovic, V.	ARC/Schmidt, G. K. 51-Biological Sci

NAG 1-50 Georgia Institute of Technology 2838
 Development of an airborne laser photofragmentation

Period	Obligations
03/01/80-07/31/90	FY89: \$440,402 TOTAL: \$2,946,201
Prin. Invest.	NASA Tech. Officer CASE Category
Davis, D. D.	LARC/Browell, E. V. 31-Atmos Sci
Bradshaw, J. D.	LARC/Carter, A. F.
Sandholm, S. T.	

NAG 1-392 Georgia Institute of Technology 2839
 Modeling of transient heat pipe operation

Period	Obligations
08/19/83-12/31/88	FY89: TOTAL: \$215,700
Prin. Invest.	NASA Tech. Officer CASE Category
Colwell, G. T.	LARC/Camarda, C. J. 46-Mech Engr
Hartley, J. G.	LARC/Robinson, J. C.

NAG 1-430 Georgia Institute of Technology 2840
 A support architecture for reliable distributed computing systems

Period	Obligations
11/09/83-03/09/90	FY89: \$44,968 TOTAL: \$276,883
Prin. Invest.	NASA Tech. Officer CASE Category
Lablanc, R. J.	LARC/Murray, N. D. 22-Computer Science
Daseupta, P.	LARC/Will, R. W.

NAG 1-566 Georgia Institute of Technology 2841
 Sound propagation over uneven ground and irregular topography

Period	Obligations
02/01/85-09/01/89	FY89: TOTAL: \$320,804
Prin. Invest.	NASA Tech. Officer CASE Category
Pierce, A. D.	LARC/Willshire, W. L., Jr. 13-Physics
Main, G. L.	
Berthelot, Y. H.	

NAG 1-586 Georgia Institute of Technology 2842
 Theoretical and material studies of thin-film electroluminescent devices

Period	Obligations
05/01/85-02/28/89	FY89: TOTAL: \$183,490
Prin. Invest.	NASA Tech. Officer CASE Category
Summers, C. J.	LARC/Robertson, J. B. 13-Physics
Brennan, K. F.	

NAG 1-623 Georgia Institute of Technology 2843
 High speed precision motion strategies for lightweight structures

Period	Obligations
11/15/85-03/31/90	FY89: \$50,000 TOTAL: \$194,880
Prin. Invest.	NASA Tech. Officer CASE Category
Book, W. J.	LARC/Soloway, D. 46-Mech Engr

NAG 1-637 Georgia Institute of Technology 2844
 Analysis of interlaminar fracture in composites under combined loading

Period	Obligations
02/12/86-09/25/90	FY89: \$110,000 TOTAL: \$230,000
Prin. Invest.	NASA Tech. Officer CASE Category
Rehfield, L. W.	LARC/O'Brien, T. K. 47-Materials Engr
Armanios, E. A.	LARC/Murri, G. B.

NAG 1-660 Georgia Institute of Technology 2845
 Singular perturbation analysis of aeroassisted orbital transfer vehicles (AOTVS) related trajectory optimization problems

Period	Obligations
03/11/86-10/31/89	FY89: \$62,892 TOTAL: \$186,363
Prin. Invest.	NASA Tech. Officer CASE Category
Calise, A. J.	LARC/Moerger, D. D. 42-Astro Engr
	LARC/Price, D. B.

NAG 1-710 Georgia Institute of Technology 2846
 Integration of dynamic aerodynamic and structural optimization of helicopter rotor blades

Period	Obligations
10/14/86-10/31/89	FY89: \$85,731 TOTAL: \$253,633
Prin. Invest.	NASA Tech. Officer CASE Category
Peters, D. A.	LARC/Adelman, H. M. 41-Aero Engr
	LARC/Pritchard, J. I.

NAG 1-784 Georgia Institute of Technology 2847
 Trajectory optimization and guidance law development for NASP applications

Period	Obligations
07/01/87-10/31/88	FY89: TOTAL: \$54,800
Prin. Invest.	NASA Tech. Officer CASE Category
Calise, A. J.	LARC/Moerder, D. D. 41-Aero Engr
Flandro, G. A.	LARC/Price, D. B.

NAG 1-786 Georgia Institute of Technology 2848
 Diagnostic studies of the HXOY NXOY O3 photochemical system using data from NASA global tropospheric experiment field expeditions

Period	Obligations
07/01/87-07/31/90	FY89: \$95,133 TOTAL: \$275,838
Prin. Invest.	NASA Tech. Officer CASE Category
Chameides, W. J.	LARC/Reichle, H. G., Jr. 31-Atmos Sci
	LARC/Fishman, J.

NAG 1-818 Georgia Institute of Technology 2849
 Two photon laser induced fluorescence sensor for the detection of atmospheric hydroxyl radicals

Period	Obligations
10/01/87-03/31/90	FY89: TOTAL: \$178,091
Prin. Invest.	NASA Tech. Officer CASE Category
Bradshaw, J. D.	LARC/Browell, E. V. 31-Atmos Sci
	LARC/Carter, A. F.

NAG 1-864 Georgia Institute of Technology 2850
 Electrostatic fluidized bed coating

Period	Obligations
04/01/88-10/31/89	FY89: \$50,069 TOTAL: \$95,849
Prin. Invest.	NASA Tech. Officer CASE Category
Muzzy, J. D.	LARC/Baucom, R. M. 12-Chemistry
Tincher, B. W.	LARC/Nelson, J. B.

NAG 1-922 Georgia Institute of Technology 2851
 On board guidance algorithms for NASP applications

Period	Obligations
11/01/88-10/31/89	FY89: \$79,960 TOTAL: \$79,960
Prin. Invest.	NASA Tech. Officer CASE Category
Cazise, A. J.	LARC/Mogrdner, D. D. 41-Aero Engr
Flandro, G. A.	LARC/Price, D. D.

NASA'S UNIVERSITY PROGRAM **GEORGIA (Continued)**

NAG 1-939 Georgia Institute of Technology 2852
Optimal guidance law development for an advanced launch system
Period Obligations
12/01/88-11/30/90 FY89: \$266,438 TOTAL: \$266,438
Prin. Invest. NASA Tech. Officer CASE Category
Cazise, A. J. LARC/Moeder, D. D. 41-Aero Engr
Hodges, D. H. LARC/Price, D. B.

NAG 1-959 Georgia Institute of Technology 2853
Nonlinear feedback control for high alpha combat maneuvers of the F 18 airplane
Period Obligations
01/25/89-01/24/90 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
Stallford, H. L. LARC/Arbuckle, P. D. 41-Aero Engr
LARC/Gracey, C.

NAG 1-1007 Georgia Institute of Technology 2854
Design analysis methods for rotorcraft vibrations
Period Obligations
06/21/89-06/20/90 FY89: \$59,736 TOTAL: \$59,736
Prin. Invest. NASA Tech. Officer CASE Category
Hanagud, S. LARC/Kvaternik, R. G. 41-Aero Engr
Craig, J. I.

NAG 1-1027 Georgia Institute of Technology 2855
Periodic trim solutions with hp-version finite elements in time
Period Obligations
07/01/89-06/30/90 FY89: \$50,219 TOTAL: \$50,219
Prin. Invest. NASA Tech. Officer CASE Category
Peters, D. A. LARC/Kvaternik, R. G. 41-Aero Engr

NAG 1-1039 Georgia Institute of Technology 2856
Enhancement of an interactive launch vehicle design package to include the generation of three dimensional finite difference grids
Period Obligations
07/01/89-06/30/90 FY89: \$39,920 TOTAL: \$39,920
Prin. Invest. NASA Tech. Officer CASE Category
Roach, R. L. LARC/McMillin, M. L. 41-Aero Engr
Forrest, J. LARC/Render, J. J.

NAG 2-413 Georgia Institute of Technology 2857
An approach to cognitive task analysis in supervisory control systems
Period Obligations
09/01/86-01/31/90 FY89: \$112,955 TOTAL: \$273,357
Prin. Invest. NASA Tech. Officer CASE Category
Mitchell, C. M. ARC/Palmer, E. A. 49-Engr, NEC
ARC/Remington, R. W.

NAG 2-462 Georgia Institute of Technology 2858
Development of an unsteady wake theory appropriate for aeroelastic analysis of rotors in hover and forward flight
Period Obligations
07/01/87-06/30/90 FY89: \$55,000 TOTAL: \$204,330
Prin. Invest. NASA Tech. Officer CASE Category
Peters, D. A. ARC/Kunz, D. L. 41-Aero Engr
ARC/Ormiston, R. A.

NAG 2-463 Georgia Institute of Technology 2859
Optimal route planning and obstacle avoidance for nap-of-the Earth helicopter flight guidance
Period Obligations
07/01/87-12/31/88 FY89: TOTAL: \$66,073
Prin. Invest. NASA Tech. Officer CASE Category
Menon, P. K. ARC/Cheng, V. H. 41-Aero Engr

NAG 2-515 Georgia Institute of Technology 2860
Pioneer Venus radio occultation oro data reduction profiles of a 13cm absorptivity
Period Obligations
07/01/88-06/30/90 FY89: \$34,828 TOTAL: \$69,656
Prin. Invest. NASA Tech. Officer CASE Category
Steffes, P. G. ARC/Lasher, L. E. 11-Astronomy
ARC/Fimmel, R. O.

NAG 3-503 Georgia Institute of Technology 2861
Micromechanistic deformation response of anisotropic allows under repeated loading
Period Obligations
12/15/83-12/31/88 FY89: TOTAL: \$307,409
Prin. Invest. NASA Tech. Officer CASE Category
Antolovich, S. D. LERC/Verrilli, M. J. 47-Materials Engr
Milligan, W. W. LERC/MacKay, R. A.
McDowell, D.

NAG 3-534 Georgia Institute of Technology 2862
Analysis of shell type structures subjected to time dependent mechanical and thermal loading
Period Obligations
04/15/84-01/10/90 FY89: \$47,157 TOTAL: \$399,777
Prin. Invest. NASA Tech. Officer CASE Category
Simitse, G. J. LERC/Chamis, C. C. 41-Aero Engr
Riff, R. LERC/Hopkins, D. A.

NAG 3-730 Georgia Institute of Technology 2863
Numerical investigations of stall flutter phenomena
Period Obligations
06/01/86-04/30/90 FY89: \$31,821 TOTAL: \$76,814
Prin. Invest. NASA Tech. Officer CASE Category
Sankar, L. N. LERC/Stefko, G. L. 41-Aero Engr
LERC/Kiraly, L. J.

NAG 3-768 Georgia Institute of Technology 2864
Unsteady viscous flows using a two equation model of turbulence
Period Obligations
01/01/87-12/31/89 FY89: \$29,968 TOTAL: \$69,928
Prin. Invest. NASA Tech. Officer CASE Category
Sankar, L. N. LERC/Potapczuk, M. G. 49-Engr, NEC
Wu, J. C.

NAG 3-895 Georgia Institute of Technology 2865
Parallel processing for the analysis of turbo machinery bladed-disk assemblies
Period Obligations
06/16/88-12/15/89 FY89: \$20,024 TOTAL: \$45,032
Prin. Invest. NASA Tech. Officer CASE Category
Kamat, M. LERC/Janetzke, D. C. 41-Aero Engr

NAG 3-972 Georgia Institute of Technology 2866
A complex permittivity and permeability measurement system for elevated temperature
Period Obligations
12/23/88-12/22/89 FY89: \$100,030 TOTAL: \$100,030
Prin. Invest. NASA Tech. Officer CASE Category
Brunasso, T. LERC/Stearns, C. A. 49-Engr, NEC
Cram, M. LERC/Behrendt, D. R.
Moore, R.

**NASA'S UNIVERSITY PROGRAM
GEORGIA (Continued)**

NAG 3-974 Georgia Institute of Technology 2867
Actively controlled shaft seals for aerospace applications
Period *Obligations*
01/01/89-12/31/89 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Salant, R. F. LERC/Proctor, M. P. 49-Engr, NEC

NAG 8-713 Georgia Institute of Technology 2875
Dynamic crystallization control hardware
Period *Obligations*
03/21/88-04/16/90 FY89: \$99,949 TOTAL: \$194,390
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Suddath, F. L. MSFC/Snyder, R. S. 12-Chemistry

NAG 3-1062 Georgia Institute of Technology 2868
Jet mixing enhancement by mechanical tabs
Period *Obligations*
07/17/89-01/16/90 FY89: \$24,995 TOTAL: \$24,995
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Ahuja, K. K. LERC/Vanco, M. R. 41-Aero Engr

NAGW 533 Georgia Institute of Technology 2876
Laboratory evaluation of microwaves absorption properties under simulated conditions for planetary atmospheres
Period *Obligations*
02/01/84-10/31/89 FY89: \$47,616 TOTAL: \$386,776
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Steffes, P. G. HQ-EL/Bergstrahl, J. T. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NAG 3-1066 Georgia Institute of Technology 2869
Novel jet noise reduction concepts
Period *Obligations*
08/10/89-03/03/90 FY89: \$80,000 TOTAL: \$80,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Ahuja, K. K. LERC/Krejsa, E. 41-Aero Engr
LERC/Groeneweg, J. F.

NAGW 729 Georgia Institute of Technology 2877
Global atmospheric gases experiment gage
Period *Obligations*
11/01/84-10/31/89 FY89: \$82,000 TOTAL: \$459,438
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Alyea, F. N. HQ-EE/McPeters, R. D. 31-Atmos Sci
Cunnold, D. M. HQ-EE/Prather, M. J.

NAG 5-1044 Georgia Institute of Technology 2870
Human computer interaction in distributed supervisory control tasks
Period *Obligations*
04/15/88-04/14/90 FY89: \$136,607 TOTAL: \$256,607
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Mitchell, C. M. GSFC/Truskowski, W. F. 22-Computer Science

NAGW 1001 Georgia Institute of Technology 2878
Laboratory investigation of stratospheric bromine chemistry
Period *Obligations*
01/01/87-12/31/89 FY89: \$115,000 TOTAL: \$330,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wine, P. H. HQ-EE/Kurylo, M. J. 31-Atmos Sci
Nicovich, J. M. HQ-EE/Watson, R. T.
Hynes, A. J.

NAG 5-1132 Georgia Institute of Technology 2871
Mantle dynamics and geodesy
Period *Obligations*
05/15/89-05/14/90 FY89: \$55,049 TOTAL: \$55,049
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hager, B. H. GSFC/Welker, J. E. 39-Env Sci, NEC

NAGW 1380 Georgia Institute of Technology 2879
Current driven double layers in a strongly magnetized laboratory plasma
Period *Obligations*
03/01/88-02/28/89 FY89: TOTAL: \$17,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hayes, M. A. HQ-ES/Desch, M. D. 13-Physics
HQ-ES/Eastman, T. E.

NAG 8-78 Georgia Institute of Technology 2872
Improvements in the global reference atmospheric model and comparisons with a global 3 D numerical model
Period *Obligations*
09/23/86-12/04/90 FY89: \$50,000 TOTAL: \$404,733
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Justus, C. G. MSFC/Johnson, D. 32-Geological Sci
Alyea, T. N. MSFC/Spray, C.

NAS 1-14654 Georgia Institute of Technology 2880
Investigation of the effects of long duration exposure on active optical system components
Period *Obligations*
10/14/76-12/31/91 FY89: TOTAL: \$329,518
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Blue, M. D. LARC/Clark, L. G. 45-Elec Engr
Gallagher, J. J. LARC/Battista, J. D.
Shackelford, R. G.

NAG 8-103 Georgia Institute of Technology 2873
Determination of strength and fracture mechanics parameters of glass materials for space related applications
Period *Obligations*
04/29/88-04/28/89 FY89: TOTAL: \$45,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Tucker, D. S. MSFC/Harwell, R. J. 47-Materials Engr
MSFC/Nichols, R. L.

NAS 1-15370 Georgia Institute of Technology 2881
Holographic data storage crystals experiment for the long duration exposure facility (LDEF)
Period *Obligations*
04/21/78-12/31/91 FY89: TOTAL: \$46,808
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Gaylord, T. K. LARC/O'neal, R. L. 45-Elec Engr
Callen, W. R. LARC/Clark, L. G.

NAG 8-626 Georgia Institute of Technology 2874
Measurements of aerosol properties needed to infer backscatter characteristics in support of NASA Doppler lidar program
Period *Obligations*
03/30/87-03/29/89 FY89: TOTAL: \$140,190
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Patterson, E. M. MSFC/Fitzjarrald, D. 39-Env Sci, NEC

NASA'S UNIVERSITY PROGRAM
GEORGIA (Continued)

NAS 1-16356 Georgia Institute of Technology 2882
Science support for Earth Radiation Budget Satellite (ERBS)/stratospheric aerosol and gas experiment (SAGE)
Period *Obligations*
08/07/80-01/31/88 FY89: TOTAL: \$335,184
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Grams, G. W. LARC/McMaster, L. R. 31-Atmos Sci
LARC/McCormick, M. P.

NAS 1-18447 Georgia Institute of Technology 2883
Earth Radiation Budget Satellite stratospheric aerosol and gas experiment
Period *Obligations*
02/05/87-02/05/90 FY89: \$15,000 TOTAL: \$45,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Grams, G. W. LARC/Maddrea, G. L. 31-Atmos Sci
LARC/McCormick, M. P.

NAS 1-18487 Georgia Institute of Technology 2884
ERBS SAGE II scientific investigation
Period *Obligations*
04/15/87-04/14/90 FY89: \$62,105 TOTAL: \$192,105
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Cunnold, D. M. LARC/Maddrea, G. L. 31-Atmos Sci
LARC/McCormick, M. P.

NAS 5-27264 Georgia Institute of Technology 2885
The prediction of the dynamical impact of changes in stratospheric ozone
Period *Obligations*
07/01/82-02/28/90 FY89: TOTAL: \$353,961
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Cunnold, D. GSFC/Reber, C. 31-Atmos Sci

NAS 8-37142 Georgia Institute of Technology 2886
Advanced microwave precipitation radiometer for the remote observation of precipitation and storm structure
Period *Obligations*
12/31/87-03/30/90 FY89: \$264,000 TOTAL: \$548,903
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Gagliano, J. MSFC/Spencer, R. 31-Atmos Sci

NAS 9-17381 Georgia Institute of Technology 2887
Space station antenna systems
Period *Obligations*
05/01/85-04/30/90 FY89: TOTAL: \$250,811
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Cooke, W. P. JSC/Eggers, D. S. 49-Engr, NEC
Dunn, A. G.

NCA 2-159 Georgia Institute of Technology 2888
Helicopter stability and control modelling improvements and verification on two helicopters
Period *Obligations*
09/01/86-10/15/88 FY89: TOTAL: \$71,816
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Schrage, D. P. ARC/Decker, W. A. 41-Aero Engr
Peters, D. A. ARC/Key, D. L.

NCA 2-266 Georgia Institute of Technology 2889
The effects of rotating frame turbulence RFT on helicopter flight mechanics loads and vibration
Period *Obligations*
10/01/87-12/31/89 FY89: \$39,985 TOTAL: \$79,862
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Schrage, D. P. ARC/Atencio, A. 41-Aero Engr
Jonnalagadda, V. R. ARC/McFarland, R. E.

NCA 2-398 Georgia Institute of Technology 2890
Theoretical and numerical studies of multi-element airfoil aerodynamics
Period *Obligations*
03/16/89-09/30/89 FY89: \$39,995 TOTAL: \$39,995
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wu, J. C. ARC/Tung, C. 41-Aero Engr

NCC 1-133 Georgia Institute of Technology 2891
Global tropospheric experiment chemical instrumentation test and evaluation 3 GTE cite 3 mission scientist program plan
Period *Obligations*
01/10/89-01/09/90 FY89: \$49,278 TOTAL: \$49,278
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Davis, D. LARC/Hoell, J. M. 31-Atmos Sci
LARC/Bendura, R. J.

NCC 2-506 Georgia Institute of Technology 2892
Aircraft pursuit evasion and min time interception algorithms for the F 15 aircraft
Period *Obligations*
11/01/87-10/31/89 FY89: \$60,816 TOTAL: \$133,478
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Menon, P. K. ARC/Duke, E. L. 41-Aero Engr
Calise, A. J. ARC/Antoniewicz, R. A.

NCC 2-575 Georgia Institute of Technology 2893
Optimal route planning and obstacle avoidance for nap of the Earth helicopter flight guidance
Period *Obligations*
10/01/88-10/31/89 FY89: \$64,839 TOTAL: \$64,839
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Menon, P. K. ARC/Cheng, V. H. 41-Aero Engr

NCC 3-116 Georgia Institute of Technology 2894
Properties of rapidly solidified Nb Al and ni Al intermetallics
Period *Obligations*
01/01/89-12/31/89 FY89: \$72,032 TOTAL: \$72,032
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Antolovich, S. D. LERC/Gray, H. R. 47-Materials Engr
Bowman, R. R.

NCC 3-135 Georgia Institute of Technology 2895
Effects of axial conduction and flow reversal
Period *Obligations*
04/01/89-03/31/90 FY89: \$49,500 TOTAL: \$49,500
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Forney, L. J. ARC/Fralick, G. C. 46-Mech Engr

NGT 00-050-208 Georgia Institute of Technology 2896
NASA graduate student researchers program
Period *Obligations*
06/01/87-05/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Suddath, F. L. HQ-XE/Owens, F. C. 12-Chemistry

NGT 00-050-369 Georgia Institute of Technology 2897
NASA graduate student researchers program
Period *Obligations*
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lipkin, H. HQ-XE/Owens, F. C. 46-Mech Engr

**NASA'S UNIVERSITY PROGRAM
GEORGIA (Continued)**

NGT 00-050-387 Georgia Institute of Technology 2898
NASA graduate student researchers program
Period Obligations
09/01/88-08/31/90 FY89: TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Menon, P. K. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 00-050-498 Georgia Institute of Technology 2899
NASA graduate student researchers program
Period Obligations
08/01/89-07/31/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Kangari, R. HQ-XE/Owens, F. C. 22-Computer Science

NGT 00-050-526 Georgia Institute of Technology 2900
NASA graduate student researchers program
Period Obligations
06/22/89-06/21/90 FY89: \$17,200 TOTAL: \$17,200
Prin. Invest. NASA Tech. Officer CASE Category
Rodrique, G. P. HQ-XE/Owens, F. C. 45-Elec Engr

NGT 00-050-535 Georgia Institute of Technology 2901
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Hayes, M. A. HQ-XE/Owens, F. C. 13-Physics

NGT 00-070-047 Georgia Institute of Technology 2902
NASA graduate student researchers program
Period Obligations
09/01/87-08/31/88 FY89: TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Chameides, W. L. HQ-XE/Owens, F. C. 31-Atmos Sci

NGT 00-070-061 Georgia Institute of Technology 2903
Graduate student researchers underrepresented minority focus program
Period Obligations
10/01/87-09/30/89 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Davis, D. HQ-XE/Owens, F. C. 31-Atmos Sci

NAG 5-496 Georgia Southern College 2904
Laboratory studies of small carbon granules
Period Obligations
02/01/85-03/31/90 FY89: \$18,730 TOTAL: \$75,025
Prin. Invest. NASA Tech. Officer CASE Category
Nelson, R. H. GSFC/Donn, B. 12-Chemistry
GSFC/Nuth, J. A.

NAG 9-265 Georgia Southern College 2905
The HBCU program A needs assessment and technical capability
Period Obligations
01/01/88-06/30/90 FY89: \$25,000 TOTAL: \$50,000
Prin. Invest. NASA Tech. Officer CASE Category
Tryman, N. D. JSC/Atkinson, J. D. 75-Political Sci

NAG 2-438 Georgia State University 2906
Selection of behavioral tasks and development of software for evaluation of rhesus monkey behavior during spaceflight
Period Obligations
03/01/87-11/30/89 FY89: \$109,504 TOTAL: \$252,004
Prin. Invest. NASA Tech. Officer CASE Category
Rumbaugh, D. M. ARC/Ballard, R. W. 51-Biological Sci
Savage, E. S. ARC/Winget, C. M.
Richardson, W. K.

NAG 5-1141 Georgia State University 2907
A search for rapid variations in the ultraviolet flux of selected astronomical objects
Period Obligations
06/15/89-06/14/90 FY89: \$18,396 TOTAL: \$18,396
Prin. Invest. NASA Tech. Officer CASE Category
Miller, H. R. GSFC/West, D. K. 11-Astronomy

NAG 5-1218 Georgia State University 2908
Colliding stellar winds in o-type close binary systems
Period Obligations
08/15/89-02/14/90 FY89: \$16,900 TOTAL: \$16,900
Prin. Invest. NASA Tech. Officer CASE Category
Gies, D. R. GSFC/West, D. K. 11-Astronomy

NGT 00-090-025 Morehouse College 2909
Project space strategic preparedness advancing careers in engineering
Period Obligations
03/01/89-05/31/90 FY89: \$290,880 TOTAL: \$290,880
Prin. Invest. NASA Tech. Officer CASE Category
Jackson, W. LARC/Peters, B. 49-Engr, NEC
Greene, M. W. HQ-U/Freeman, Y.

NAG 1-712 Spelman College 2910
Two dimensional data compression and restoration
Period Obligations
11/01/86-03/31/90 FY89: \$90,000 TOTAL: \$287,472
Prin. Invest. NASA Tech. Officer CASE Category
Martin, B. J. LARC/Goode, P. W. 29-Math/Computer, NEC
Bozeman, S. T.

NGT 00-090-003 Spelman College 2911
Women science and engineering scholars program
Period Obligations
12/01/86-12/31/89 FY89: \$134,675 TOTAL: \$991,064
Prin. Invest. NASA Tech. Officer CASE Category
Falconer, E. HQ/White, B. 45-Elec Engr

NGT 00-090-018 Spelman College 2912
Pre freshman science and engineering program
Period Obligations
06/12/88-06/11/89 FY89: TOTAL: \$54,386
Prin. Invest. NASA Tech. Officer CASE Category
Hibbard, L. HQ-U/Margolis, M. 49-Engr, NEC
Falconer, E.

NAG 5-974 University of Georgia 2913
First observations of the pleiades transition region line
Period Obligations
09/01/87-06/30/89 FY89: TOTAL: \$15,446
Prin. Invest. NASA Tech. Officer CASE Category
Caillault, J. P. GSFC/Kondo, Y. 11-Astronomy
Linsky, J. L.
Vilhu, O.

NASA'S UNIVERSITY PROGRAM **GEORGIA (Continued)**

NAG 5-1111 University of Georgia 2914
Satellite studies of continental shelf processes off the U.S. East coast
Period Obligations
11/15/88-11/14/89 FY89: \$65,000 TOTAL: \$65,000
Prin. Invest. NASA Tech. Officer CASE Category
Menzel, D. W. GSFC/McClain, C. R. 33-Oceanography

NAG 5-1148 University of Georgia 2915
Observation of a selected small group of short period binaries
Period Obligations
06/15/89-06/14/90 FY89: \$20,816 TOTAL: \$20,816
Prin. Invest. NASA Tech. Officer CASE Category
Shaw, J. S. GSFC/West, D. K. 11-Astronomy

NAG 5-1178 University of Georgia 2916
A search for premain sequence stars in the high latitude molecular clouds
Period Obligations
07/15/89-07/14/90 FY89: \$34,000 TOTAL: \$34,000
Prin. Invest. NASA Tech. Officer CASE Category
Caillault, J. P. GSFC/West, D. 11-Astronomy

NAG 5-1192 University of Georgia 2917
Analysis of the first ISLSCP field experiment (FIFE) data
Period Obligations
09/01/89-02/28/90 FY89: \$105,000 TOTAL: \$105,000
Prin. Invest. NASA Tech. Officer CASE Category
Kanemasu, E. GSFC/Hall, F. G. 31-Atmos Sci

NAGW 1034 University of Georgia 2918
Using the thermareil from a forest
Period Obligations
02/01/87-09/30/89 FY89: \$35,552 TOTAL: \$93,988
Prin. Invest. NASA Tech. Officer CASE Category
Teskey, R. O. HQ-EE/Wickland, D. E. 39-Env Sci, NEC
Luvall, J. C. HQ-EE/Ruzek, M. J.

NAGW 1338 University of Georgia 2919
Comparison of simulation modeling and satellite techniques for monitoring global ecology
Period Obligations
07/01/88-12/31/89 FY89: TOTAL: \$4,993
Prin. Invest. NASA Tech. Officer CASE Category
Box, E. O. HQ-EE/Wickland, D. E. 39-Env Sci, NEC
HQ-EE/Ruzek, M. J.

NAGW 1500 University of Georgia 2920
Ocean color studies of the eastern Atlantic
Period Obligations
12/01/88-11/30/89 FY89: \$132,000 TOTAL: \$132,000
Prin. Invest. NASA Tech. Officer CASE Category
Yoder, J. A. HQ-EE/Lewis, M. 33-Oceanography

NAG13-10 University of Georgia 2921
Thermal modeling of tropical forest land cover from multisensor imagery
Period Obligations
09/22/88-09/30/90 FY89: \$39,999 TOTAL: \$75,624
Prin. Invest. NASA Tech. Officer CASE Category
Welch, R. A. SSC/Luvall, J. C. 54-Env Biology

NASW 4194 University of Georgia 2922
Operation of a computer software management and information center
Period Obligations
07/01/86-06/30/90 FY89: \$190,364 TOTAL: \$778,114
Prin. Invest. NASA Tech. Officer CASE Category
Carmon, J. L. HQ/Ault, L. 99-Multi-Discip

HAWAII

NAG 2-418 University of Hawaii - Manoa 2923
Submillimeter observations of solar continuum brightness variations
Period Obligations
01/01/87-03/31/89 FY89: TOTAL: \$113,060
Prin. Invest. NASA Tech. Officer CASE Category
Becklin, E. E. ARC/Haughney, L. C. 11-Astronomy
Werner, M. W.

NAG 2-560 University of Hawaii - Manoa 2924
Pacific communications network
Period Obligations
01/01/89-12/31/89 FY89: \$292,400 TOTAL: \$292,400
Prin. Invest. NASA Tech. Officer CASE Category
Nielsen, T. N. ARC/Jones, W. P. 22-Computer Science
Watanabe, D. S. ARC/Siegel, M. R.
Ghali, M. A.

NAG 5-146 University of Hawaii - Manoa 2925
Magnesium observations of a young cluster
Period Obligations
03/15/81-10/31/90 FY89: \$58,000 TOTAL: \$510,546
Prin. Invest. NASA Tech. Officer CASE Category
Simon, T. GSFC/West, D. 11-Astronomy
Carpenter, K.
Praderie, F.

NAG 5-744 University of Hawaii - Manoa 2926
Solar observations for the Solar Maximum Mission
Period Obligations
04/01/86-10/31/89 FY89: \$9,337 TOTAL: \$235,260
Prin. Invest. NASA Tech. Officer CASE Category
Canfield, R. C. GSFC/Bullock, G. D. 19-Phys Sci, NEC
GSFC/Gurman, J. B.

NAG 5-829 University of Hawaii - Manoa 2927
Ultraviolet emission line studies in the core of X ray luminous clusters
Period Obligations
08/01/86-07/31/88 FY89: TOTAL: \$12,317
Prin. Invest. NASA Tech. Officer CASE Category
Cowie, L. L. GSFC/Kondo, Y. 11-Astronomy
Hu, E.

NAG 5-931 University of Hawaii - Manoa 2928
Coding for efficient and reliable satellite and space communications
Period Obligations
07/01/87-06/30/90 FY89: \$60,000 TOTAL: \$177,271
Prin. Invest. NASA Tech. Officer CASE Category
Lin, S. GSFC/Morakis, J. C. 49-Engr, NEC
GSFC/Miller, W. H.

NASA'S UNIVERSITY PROGRAM
HAWAII (Continued)

NAG 5-993 University of Hawaii - Manoa 2929
 Ultraviolet studies of extended emission-line regions around quasi-stellar objects

<i>Period</i>		<i>Obligations</i>
09/15/87-09/14/89	FY89:	TOTAL: \$14,800
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hu, E. M.	GSFC/Kondo, Y.	11-Astronomy
Stockton, A.		
Cowie, L. L.		

NAGW 133 University of Hawaii - Manoa 2937
 Volatile evolution

<i>Period</i>		<i>Obligations</i>
02/01/81-10/31/89	FY89: \$30,000	TOTAL: \$427,649
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Fanale, F. P.	HQ-EL/Underwood, J. R.	32-Geological Sci
Taylor, G. J.	HQ-EL/Boyce, J. M.	
Johnson, S.		

NAG 5-1072 University of Hawaii - Manoa 2930
 Chromospheric evaporation in flares and active regions SMM

<i>Period</i>		<i>Obligations</i>
10/01/88-11/30/89	FY89:	TOTAL: \$29,638
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Comfield, R. G.	GSFC/Bullock, G. D.	19-Phys Sci, NEC
	GSFC/Gurman, J. B.	

NAGW 237 University of Hawaii - Manoa 2938
 Geologic studies of planetary volcanic and impact processes

<i>Period</i>		<i>Obligations</i>
08/01/81-10/31/89	FY89: \$62,000	TOTAL: \$472,347
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hawke, B. R.	HQ-EL/Underwood, J.	32-Geological Sci
	HQ-EL/Boyce, J. M.	

NAG 5-1251 University of Hawaii - Manoa 2931
 A search for luminous infrared-bright galaxies using infrared astronomical satellite (IRAS) archival data

<i>Period</i>		<i>Obligations</i>
09/15/89-12/14/89	FY89: \$10,000	TOTAL: \$10,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Sanders, D. B.	GSFC/West, D.	11-Astronomy

NAGW 437 University of Hawaii - Manoa 2939
 Analysis of Martian surface materials using radar thermal and color data and geological evolution of the cavity created hemisphere of Mars

<i>Period</i>		<i>Obligations</i>
04/01/83-10/31/89	FY89: \$26,700	TOTAL: \$284,633
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Mark, P. M.	HQ-EL/Underwood, J. R.	32-Geological Sci
	HQ-EL/Boyce, J. M.	

NAG 5-1256 University of Hawaii - Manoa 2932
 Studies of the evolution of the X-ray emission of clusters of galaxies

<i>Period</i>		<i>Obligations</i>
09/01/89-11/30/89	FY89: \$7,500	TOTAL: \$7,500
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Henry, J. P.	GSFC/West, D.	11-Astronomy

NAGW 498 University of Hawaii - Manoa 2940
 Thermophysics of satellites and asteroids

<i>Period</i>		<i>Obligations</i>
10/01/83-09/30/88	FY89:	TOTAL: \$27,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Morrison, D.	HQ-EL/Boyce, J. M.	32-Geological Sci
	HQ-EL/Holt, H. E.	

NAG 5-1257 University of Hawaii - Manoa 2933
 Studies of gas in cooling flow clusters

<i>Period</i>		<i>Obligations</i>
09/01/89-11/30/89	FY89: \$8,000	TOTAL: \$8,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hu, E.	GSFC/West, D.	11-Astronomy

NAGW 583 University of Hawaii - Manoa 2941
 Volatile migration and phase changes on Mars

<i>Period</i>		<i>Obligations</i>
02/01/84-01/31/90	FY89: \$65,000	TOTAL: \$359,999
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Fanale, F. P.	HQ-EL/Underwood, J.	32-Geological Sci
	HQ-EL/Boyce, J. M.	

NAG 8-634 University of Hawaii - Manoa 2934
 A preliminary data base for the NASA Doppler lidar program

<i>Period</i>		<i>Obligations</i>
08/01/87-07/31/89	FY89:	TOTAL: \$164,097
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Clarke, A. D.	MSFC/Fitzjarrald, D. E.	31-Atmos Sci
	MSFC/Miller, T. L.	

NAGW 633 University of Hawaii - Manoa 2942
 Volatiles on planetary satellites

<i>Period</i>		<i>Obligations</i>
06/21/84-11/20/89	FY89: \$43,000	TOTAL: \$286,533
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Fanale, F. P.	HQ-EL/Underwood, J.	32-Geological Sci
	HQ-EL/Boyce, J. M.	

NAG 8-730 University of Hawaii - Manoa 2935
 Mass in flow studies of cooling flow clusters

<i>Period</i>		<i>Obligations</i>
06/01/88-05/31/89	FY89:	TOTAL: \$37,845
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Cowie, L. L.	MSFC/Harper, B.	11-Astronomy

NAGW 712 University of Hawaii - Manoa 2943
 Spectral studies of possible asteroid materials

<i>Period</i>		<i>Obligations</i>
01/01/85-10/31/89	FY89: \$29,200	TOTAL: \$169,200
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Bell, J. F.	HQ-EL/Underwood, J., Jr.	32-Geological Sci
	HQ-EL/Boyce, J. M.	

NAG 8-738 University of Hawaii - Manoa 2936
 Evolution of X ray emission of clusters of galaxies

<i>Period</i>		<i>Obligations</i>
07/01/88-06/30/89	FY89:	TOTAL: \$37,423
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Henry, J. P.	MSFC/Harper, B. A.	11-Astronomy

NAGW 723 University of Hawaii - Manoa 2944
 Modeling of the solar chromosphere by submillimeter observations of solar comb

<i>Period</i>		<i>Obligations</i>
03/15/85-03/31/90	FY89: \$72,000	TOTAL: \$215,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Lindsey, C.	HQ-ES/Bohlin, J. D.	13-Physics
	HQ-ES/Kane, S.	

NASA'S UNIVERSITY PROGRAM **HAWAII (Continued)**

NAGW 755	University of Hawaii - Manoa	2945	Characterization of infrared detector arrays
<i>Period</i>	<i>Obligations</i>		
06/15/85-01/31/90	FY89: \$150,000	TOTAL: \$1,193,986	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hall, D. N.	HQ-EZ/Stachnik, R. V.	13-Physics	
	HQ-EZ/Weiler, E. J.		
NAGW 802	University of Hawaii - Manoa	2946	Infrared spectral studies of asteroids
<i>Period</i>	<i>Obligations</i>		
09/01/85-12/31/89	FY89: \$40,000	TOTAL: \$150,405	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Bell, W. J.	HQ-EL/Brinton, H. C.	11-Astronomy	
	HQ-EL/Rahe, J. H.		
NAGW 864	University of Hawaii - Manoa	2947	Radiating solar plasma
<i>Period</i>	<i>Obligations</i>		
02/01/86-01/31/90	FY89: \$126,000	TOTAL: \$575,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
McClymont, A. N.	HQ-ES/Bohlin, J. D.	13-Physics	
Fisher, G.	HQ-ES/Kane, S.		
NAGW 927	University of Hawaii - Manoa	2948	Physical properties of asteroid family members
<i>Period</i>	<i>Obligations</i>		
07/01/86-10/31/89	FY89: \$30,000	TOTAL: \$117,335	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Lucey, P. G.	HQ-EL/Underwood, J. R.	32-Geological Sci	
	HQ-EL/Boyce, J. M.		
NAGW 959	University of Hawaii - Manoa	2949	Interstellar and intergalactic gas
<i>Period</i>	<i>Obligations</i>		
07/11/86-07/31/90	FY89: \$76,024	TOTAL: \$147,085	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Cowie, L. L.	HQ-EZ/Gillett, F. C.	11-Astronomy	
	HQ-EZ/Boggess, N.		
NAGW 1053	University of Hawaii - Manoa	2950	Regional planetary image center
<i>Period</i>	<i>Obligations</i>		
11/15/86-11/14/89	FY89: \$32,019	TOTAL: \$87,514	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hawke, B. R.	HQ-EL/Underwood, J. R.	32-Geological Sci	
	HQ-EL/Scott, D.		
NAGW 1084	University of Hawaii - Manoa	2951	Structural and volcanic evolution of Martian and terrestrial shield volcanoes
<i>Period</i>	<i>Obligations</i>		
05/01/87-04/30/90	FY89: \$92,336	TOTAL: \$137,336	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Mouginis Mark, P. J.	HQ-EL/Underwood, J. R.	32-Geological Sci	
	HQ-EL/Boyce, J. M.		
NAGW 1162	University of Hawaii - Manoa	2952	Testing a model for the morphologic evolution of volcanoes in the Galapagos
<i>Period</i>	<i>Obligations</i>		
09/01/87-08/31/89	FY89: \$86,000	TOTAL: \$190,946	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Mark, P. J.	HQ-EE/Baltuck, M.	32-Geological Sci	
	HQ-EE/Murphy, R. E.		
NAGW 1216	University of Hawaii - Manoa	2953	Theoretical and photometric analysis of water volcanism on the moon of Uranus
<i>Period</i>	<i>Obligations</i>		
09/15/87-09/14/90	FY89: \$55,000	TOTAL: \$106,068	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Wilson, L.	HQ-EL/Quaide, W. L.	19-Phys Sci, NEC	
	HQ-EL/Underwood, J.		
NAGW 1299	University of Hawaii - Manoa	2954	Mid infrared spectroscopy of the Moon and Mars
<i>Period</i>	<i>Obligations</i>		
05/01/88-04/30/90	FY89: \$20,000	TOTAL: \$35,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Lucey, P. G.	HQ-EL/Brinton, H. C.	11-Astronomy	
	HQ-EL/Rahe, J. M.		
NAGW 1345	University of Hawaii - Manoa	2955	Geologic mapping in nw elysium planitia Mars
<i>Period</i>	<i>Obligations</i>		
05/01/88-04/30/90	FY89: \$10,500	TOTAL: \$32,087	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Mouginis Mark, P. J.	HQ-EL/Underwood, J. R.	32-Geological Sci	
NAGW 1383	University of Hawaii - Manoa	2956	Reflectance spectroscopy of phobos and Deimos
<i>Period</i>	<i>Obligations</i>		
07/01/88-06/30/90	FY89: \$20,000	TOTAL: \$50,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Bell, J. F.	HQ-EL/Rahe, J. H.	11-Astronomy	
NAGW 1385	University of Hawaii - Manoa	2957	Ultra high resolution Earth based lunar radar
<i>Period</i>	<i>Obligations</i>		
03/01/88-10/31/89	FY89: \$27,600	TOTAL: \$71,230	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Zisk, S. H.	HQ-EL/Underwood, J. R.	32-Geological Sci	
NAGW 1421	University of Hawaii - Manoa	2958	Mineralogical mapping of the lunar surface
<i>Period</i>	<i>Obligations</i>		
03/01/88-09/30/89	FY89: \$14,500	TOTAL: \$39,500	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Lucey, P. G.	HQ-EL/Underwood, J. R.	32-Geological Sci	
NAGW 1454	University of Hawaii - Manoa	2959	Solar imaging vector magnetograph
<i>Period</i>	<i>Obligations</i>		
08/01/88-07/31/90	FY89: \$118,501	TOTAL: \$318,501	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Canfield, R. C.	HQ-ES/Bohlin, J. D.	13-Physics	
	HQ-ES/Kane, S.		
NAGW 1492	University of Hawaii - Manoa	2960	Multispectral and textural analysis of 5 color Voyager 2 images of the uranian satellites
<i>Period</i>	<i>Obligations</i>		
12/01/88-11/30/90	FY89: \$56,356	TOTAL: \$56,356	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
McCord, T. M.	HQ-EL/Quaide, W. L.	19-Phys Sci, NEC	

NASA'S UNIVERSITY PROGRAM
HAWAII (Continued)

NAGW 1507 University of Hawaii - Manoa 2961
 Temporal monitoring of active comets
Period Obligations
 10/01/88-09/30/89 FY89: \$22,633 TOTAL: \$22,633
Prin. Invest. NASA Tech. Officer CASE Category
 Jewitt, D. C. HQ-EL/Rahe, J. H. 11-Astronomy

NAS 5-33006 University of Hawaii - Manoa 2969
 Earth observing SEPTM interdisciplinary investigation
Period Obligations
 09/25/89-12/14/90 FY89: \$10,000 TOTAL: \$10,000
Prin. Invest. NASA Tech. Officer CASE Category
 Lukas, R. GSFC/Soffen, G. 33-Oceanography

NAGW 1542 University of Hawaii - Manoa 2962
 Coronal and chromospheric physics in support of solar A and MAX 91
Period Obligations
 11/01/88-10/31/89 FY89: \$311,255 TOTAL: \$311,255
Prin. Invest. NASA Tech. Officer CASE Category
 Canfield, R. C. HQ-ES/Bohlin, J. D. 13-Physics
 HQ-ES/Kane, S.

NASW 3159 University of Hawaii - Manoa 2970
 Provision of support during the preparatory stage for operation of the NASA infrared telescope facility
Period Obligations
 01/01/78-12/31/89 FY89: \$2,135,670 TOTAL: \$17,411,951
Prin. Invest. NASA Tech. Officer CASE Category
 Becklin, E. HQ-EL/Brinton, H. 11-Astronomy
 HQ-EL/Quaide, W. L.

NAGW 1604 University of Hawaii - Manoa 2963
 The water regime of Phobos
Period Obligations
 12/01/88-11/30/89 FY89: \$34,024 TOTAL: \$34,024
Prin. Invest. NASA Tech. Officer CASE Category
 Fanale, F. HQ-EL/Quaide, W. L. 32-Geological Sci

NASW 4018 University of Hawaii - Manoa 2971
 Advanced terrestrial remote sensing
Period Obligations
 01/01/85-12/31/87 FY89: TOTAL: \$211,171
Prin. Invest. NASA Tech. Officer CASE Category
 Singer, R. B. HQ-EE/Murphy, R. 32-Geological Sci
 Blake, P. L. HQ-EE/Wickland, D.

NAGW 1698 University of Hawaii - Manoa 2964
 Tomography of solar active regions
Period Obligations
 02/01/89-01/31/90 FY89: \$106,694 TOTAL: \$106,694
Prin. Invest. NASA Tech. Officer CASE Category
 Labonte, B. J. HQ-ES/Bohlin, J. D. 13-Physics
 HQ-ES/Kane, S.

NCA 2-75 University of Hawaii - Manoa 2972
 Infrared studies of visual reflection nebulae
Period Obligations
 09/01/85-08/31/89 FY89: TOTAL: \$9,000
Prin. Invest. NASA Tech. Officer CASE Category
 Sellgren, K. ARC/Werner, M. W. 11-Astronomy

NAGW 1699 University of Hawaii - Manoa 2965
 A lyman alpha tunable acousto-optic filter for detecting superthermal flare protons
Period Obligations
 11/01/88-10/31/89 FY89: \$77,000 TOTAL: \$77,000
Prin. Invest. NASA Tech. Officer CASE Category
 Orrall, F. Q. HQ-ES/Bohlin, J. D. 13-Physics
 HQ-ES/Kane, S.

NGF 12-001-103 University of Hawaii - Manoa 2973
 Construction and furnishing of a permanent mid level facility (MLF) at Hale Pohaku in support of NASA's IRTF facility
Period Obligations
 10/01/82-03/31/89 FY89: TOTAL: \$1,479,901
Prin. Invest. NASA Tech. Officer CASE Category
 Hall, D. N. HQ-EL/Brinton, H. C. 11-Astronomy

NAS 5-28595 University of Hawaii - Manoa 2966
 Modification to and maintenance and operation of the lunar and satellite laser ranging ground station equipment at Mt. Haleakala Maui Hawaii in support of lunar and satellite tracking missions
Period Obligations
 10/01/84-01/31/89 FY89: \$183,380 TOTAL: \$3,003,697
Prin. Invest. NASA Tech. Officer CASE Category
 Hall, D. N. GSFC/Appler, R. A. 11-Astronomy
 Bonsack, W. B. GSFC/Portas, S. B.
 MacKnik, L.

NGL 12-001-011 University of Hawaii - Manoa 2974
 Research in coronal and chromospheric physics
Period Obligations
 11/16/84-10/31/89 FY89: TOTAL: \$6,157,393
Prin. Invest. NASA Tech. Officer CASE Category
 Canfield, R. HQ-EZ/Ahluwalia, H. S. 11-Astronomy
 HQ-EZ/Spicer, D. S.

NAS 5-30021 University of Hawaii - Manoa 2967
 Definition study of an advanced scientific instrument for the Hubble space telescope
Period Obligations
 09/30/86-06/30/89 FY89: \$470,000 TOTAL: \$1,039,000
Prin. Invest. NASA Tech. Officer CASE Category
 Hall, D. N. GSFC/Sours, W. P. 41-Aero Engr
 Capps, R. W. GSFC/Shannon, J. L.

NGL 12-001-057 University of Hawaii - Manoa 2975
 Research in planetary studies
Period Obligations
 05/21/68-10/31/89 FY89: \$333,000 TOTAL: \$9,769,252
Prin. Invest. NASA Tech. Officer CASE Category
 Hall, D. N. HQ-EL/Brinton, H. C. 11-Astronomy
 HQ-EL/Rahe, J. H.

NAS 5-30535 University of Hawaii - Manoa 2968
 Support to lunar and satellite laser ranging ground station at Mt Haleakala
Period Obligations
 02/01/89-02/01/94 FY89: \$350,000 TOTAL: \$350,000
Prin. Invest. NASA Tech. Officer CASE Category
 Hall, D. N. GSFC/Appler, R. 11-Astronomy
 MacKnik, L. S.

NGR 12-001-109 University of Hawaii - Manoa 2976
 N-heterocyclic compounds role in chemical evolution distribution in meteorites ancient sediments and as products of spark discharge reactions
Period Obligations
 06/26/72-05/14/88 FY89: TOTAL: \$694,741
Prin. Invest. NASA Tech. Officer CASE Category
 Folsome, C. E. HQ-EB/Devincenzi, D. L. 51-Biological Sci
 HQ-EB/Averner, M.

NASA'S UNIVERSITY PROGRAM **HAWAII (Continued)**

NGT 00-050-104 University of Hawaii - Manoa 2977
 NASA graduate student researchers program
Period Obligations
 09/01/86-08/31/88 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
 Fanale, F. P. HQ-LE/Owens, F. C. 32-Geological Sci

NGT 00-050-291 University of Hawaii - Manoa 2978
 NASA graduate student researchers program
Period Obligations
 09/01/88-08/31/90 FY89: \$32,760 TOTAL: \$32,760
Prin. Invest. NASA Tech. Officer CASE Category
 Kari, D. HQ-XE/Owens, F. C. 13-Physics

NGT 12-004-801 University of Hawaii - Manoa 2979
 NASA graduate student researchers program
Period Obligations
 07/01/85-06/30/88 FY89: TOTAL: \$53,997
Prin. Invest. NASA Tech. Officer CASE Category
 Sinton, J. M. HQ-LE/Owens, F. C. 32-Geological Sci

NSG 7312 University of Hawaii - Manoa 2980
 Remote compositional mapping of the lunar surface
Period Obligations
 02/01/77-09/30/89 FY89: \$166,300 TOTAL: \$2,653,807
Prin. Invest. NASA Tech. Officer CASE Category
 McCord, T. B. HQ-EL/Underwood, J. R. 32-Geological Sci
 HQ-EL/Boyce, J. M.

NSG 7323 University of Hawaii - Manoa 2981
 Research in planetary astronomy
Period Obligations
 02/01/77-02/28/90 FY89: \$133,182 TOTAL: \$1,491,854
Prin. Invest. NASA Tech. Officer CASE Category
 McCord, T. B. HQ-EL/Brinton, H. C. 11-Astronomy
 HQ-EL/Rahe, J. H.

IDAHO

NAG 1-923 University of Idaho 2982
 Participation in the GTE cite 3 intercomparison study of prominent analytical methods for airborne measurements of tropospheric sulfur containing gases
Period Obligations
 11/02/88-11/01/90 FY89: \$180,908 TOTAL: \$180,908
Prin. Invest. NASA Tech. Officer CASE Category
 Farwell, S. O. LARC/Bendura, R. J. 31-Atmos Sci
 Chatham, W. H. LARC/Hoell, J. M.
 MacTaggart, D. L.

NAG 5-1043 University of Idaho 2983
 Red time very large scale integrated circuit digital controller systems
Period Obligations
 04/15/88-09/30/90 FY89: \$100,099 TOTAL: \$200,099
Prin. Invest. NASA Tech. Officer CASE Category
 Maki, G. K. GSFC/Miller, W. H. 49-Engr, NEC
 Reynolds, G. R. GSFC/Morakis, J. C.

NAGW 1406 University of Idaho 2984
 University space engineering research center VLSI hardware acceleration center
Period Obligations
 06/01/88-02/28/90 FY89: \$1,250,500 TOTAL: \$1,750,500
Prin. Invest. NASA Tech. Officer CASE Category
 Maki, G. K. HQ-RC/Smith, P. H. 49-Engr, NEC

NAS 5-26534 University of Idaho 2985
 Design, development, fabrication and testing of a Reed-Solomon (RS) encoder/decoder unit
Period Obligations
 04/28/81-09/30/89 FY89: \$160,000 TOTAL: \$1,147,886
Prin. Invest. NASA Tech. Officer CASE Category
 Maki, G. K. GSFC/Miller, W. 45-Elec Engr

ILLINOIS

NAG 9-313 Depaul University 2986
 An image compression algorithm for a high resolution digital still camera
Period Obligations
 09/15/88-08/31/89 FY89: TOTAL: \$9,027
Prin. Invest. NASA Tech. Officer CASE Category
 Nerheim, R. JSC/Goldstein, S. H. 19-Phys Sci, NEC

NAG 1-871 Illinois Institute of Technology 2987
 Supersonic combustion ramjet scram
Period Obligations
 04/01/88-08/31/88 FY89: TOTAL: \$13,984
Prin. Invest. NASA Tech. Officer CASE Category
 Acharya, M. LARC/Guy, R. W. 41-Aero Engr
 LARC/Voland, R. T.

NAG 2-547 Illinois Institute of Technology 2988
 Electro optical system to measure strains at high temperature
Period Obligations
 09/01/88-08/31/90 FY89: \$101,595 TOTAL: \$101,595
Prin. Invest. NASA Tech. Officer CASE Category
 Sciammarella, C. A. GSFC/Reardon, L. F. 41-Aero Engr
 GSFC/Bogue, R. K.

NCC 3-101 Illinois Institute of Technology 2989
 Rapidly solidified Cu Cr and Cu Zr alloys
Period Obligations
 12/10/87-06/30/89 FY89: TOTAL: \$49,541
Prin. Invest. NASA Tech. Officer CASE Category
 Nash, P. LERC/Gray, H. R. 47-Materials Engr

NGT 00-050-434 Illinois Institute of Technology 2990
 NASA graduate student researchers program
Period Obligations
 08/01/89-07/31/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
 Wong, T. T. HQ-XE/Owens, F. C. 45-Elec Engr

**NASA'S UNIVERSITY PROGRAM
ILLINOIS (Continued)**

NAG 1-650	Northwestern University	2991	Parallel processors and nonlinear structural dynamics algorithms and software
<i>Period</i>	<i>Obligations</i>		03/01/86-05/31/90
<i>Prin. Invest.</i>	FY89: NASA Tech. Officer	TOTAL: \$221,030	Belytschko, T. B.
	LARC/Housner, J. M.	CASE Category	
	LARC/Stroud, W. J.	46-Mech Engr	
NAG 1-1031	Northwestern University	2992	Monte Carlo simulation of systems reliability
<i>Period</i>	<i>Obligations</i>		09/01/89-08/31/90
<i>Prin. Invest.</i>	FY89: \$39,940 NASA Tech. Officer	TOTAL: \$39,940	Lewis, E. E.
	LARC/Bavuso, S. J.	CASE Category	
	LARC/Pitts, F. L.	29-Math/Computer, NEC	
NAG 3-501	Northwestern University	2993	Electrical properties of materials for high temperature strain gage applications
<i>Period</i>	<i>Obligations</i>		12/21/83-11/30/88
<i>Prin. Invest.</i>	FY89: NASA Tech. Officer	TOTAL: \$435,876	Brittain, J. O.
	LERC/Englund, D. R.	CASE Category	
		47-Materials Engr	
NAG 3-747	Northwestern University	2994	Theory of solidification
<i>Period</i>	<i>Obligations</i>		10/10/86-10/09/90
<i>Prin. Invest.</i>	FY89: NASA Tech. Officer	TOTAL: \$330,000	Davis, S. H.
	LERC/Chait, A.	CASE Category	
		47-Materials Engr	
NAG 3-822	Northwestern University	2995	Probabilistic finite elements for fatigue and fracture analysis
<i>Period</i>	<i>Obligations</i>		01/05/88-04/04/90
<i>Prin. Invest.</i>	FY89: \$50,000 NASA Tech. Officer	TOTAL: \$121,833	Belytschko, T.
	LERC/Chamis, C. C.	CASE Category	
	LERC/Hopkins, D. A.	42-Astro Engr	Kiu, W. K.
NAG 3-896	Northwestern University	2996	Kinetics and mechanisms of perfluorinated reactions on iron and oxidized iron surfaces
<i>Period</i>	<i>Obligations</i>		06/01/88-05/30/90
<i>Prin. Invest.</i>	FY89: \$57,372 NASA Tech. Officer	TOTAL: \$117,658	Stair, P. C.
	LERC/Jones, W. R.	CASE Category	
		12-Chemistry	
NAG 3-950	Northwestern University	2997	Character of metal matrix
<i>Period</i>	<i>Obligations</i>		11/15/88-11/15/89
<i>Prin. Invest.</i>	FY89: \$335,000 NASA Tech. Officer	TOTAL: \$335,000	Daniel, I. M.
	LERC/Chamis, C. C.	CASE Category	
		41-Aero Engr	
NAG 5-181	Northwestern University	2998	Research relative to electroformed X-ray mirrors
<i>Period</i>	<i>Obligations</i>		05/15/81-03/31/90
<i>Prin. Invest.</i>	FY89: \$157,000 NASA Tech. Officer	TOTAL: \$607,337	Ulmer, M. P.
	GSFC/Early, L. J.	CASE Category	
	GSFC/Pless, R. H.	11-Astronomy	
NAG 5-885	Northwestern University	2999	Regional lithospheric deformation and contemporary plate motions
<i>Period</i>	<i>Obligations</i>		03/15/87-03/14/90
<i>Prin. Invest.</i>	FY89: \$85,000 NASA Tech. Officer	TOTAL: \$258,156	Stein, S. A.
	GSFC/Frey, H. V.	CASE Category	
		32-Geological Sci	Gordon, R. G.
			Jurdy, D. M.
NAG 5-933	Northwestern University	3000	Gamma ray continuous measurements of the galactic center region
<i>Period</i>	<i>Obligations</i>		07/01/87-02/28/90
<i>Prin. Invest.</i>	FY89: NASA Tech. Officer	TOTAL: \$58,053	Ulmer, M. P.
	GSFC/Bullock, G. D.	CASE Category	
	GSFC/Gurman, J. B.	19-Phys Sci, NEC	
NAG 5-1008	Northwestern University	3001	Synthesis of finite displacements and displacement rates in continental margins
<i>Period</i>	<i>Obligations</i>		09/15/87-11/14/89
<i>Prin. Invest.</i>	FY89: NASA Tech. Officer	TOTAL: \$164,051	Speed, R. C.
	GSFC/Welker, J. E.	CASE Category	
		32-Geological Sci	
NAG 5-1146	Northwestern University	3002	Ultraviolet observations of a unique herbig haro object
<i>Period</i>	<i>Obligations</i>		06/15/89-06/14/90
<i>Prin. Invest.</i>	FY89: \$6,400 NASA Tech. Officer	TOTAL: \$6,400	Zadeh, F. Y.
	GSFC/West, D. K.	CASE Category	
		11-Astronomy	
NAG 5-1147	Northwestern University	3003	Small-scale structure in the diffuse interstellar medium
<i>Period</i>	<i>Obligations</i>		06/15/89-06/14/90
<i>Prin. Invest.</i>	FY89: \$26,901 NASA Tech. Officer	TOTAL: \$26,901	Meyer, D. M.
	GSFC/West, D. K.	CASE Category	
		11-Astronomy	
NAG 5-1156	Northwestern University	3004	Seismological constraints on the subduction process
<i>Period</i>	<i>Obligations</i>		07/01/89-06/30/90
<i>Prin. Invest.</i>	FY89: \$37,498 NASA Tech. Officer	TOTAL: \$37,498	Stein, S.
	GSFC/Welker, J. E.	CASE Category	
		32-Geological Sci	
NAG 8-604	Northwestern University	3005	Cluster interactions via morphological studies
<i>Period</i>	<i>Obligations</i>		06/23/86-03/22/89
<i>Prin. Invest.</i>	FY89: NASA Tech. Officer	TOTAL: \$14,077	Ulmer, M. P.
	MSFC/Potter, P. Y.	CASE Category	
		11-Astronomy	
NAG 8-681	Northwestern University	3006	A search for gamma ray emission from three pulsars using the HEAO 3 C 1 data base
<i>Period</i>	<i>Obligations</i>		08/01/87-12/31/89
<i>Prin. Invest.</i>	FY89: NASA Tech. Officer	TOTAL: \$29,000	Ulmer, M. P.
	MSFC/Havrisik, D.	CASE Category	
		11-Astronomy	

**NASA'S UNIVERSITY PROGRAM
ILLINOIS (Continued)**

NAG 8-769 Northwestern University 3007
Coarsening in solid liquid mixtures
Period Obligations
11/01/88-10/31/89 FY89: \$107,767 TOTAL: \$107,767
Prin. Invest. NASA Tech. Officer CASE Category
Voorhees, P. W. MSFC/Frazier, D. A. 47-Materials Engr
Hardy, S. C.

NAGW 768 Northwestern University 3008
Theoretical studies of high energy transients
Period Obligations
07/15/85-01/31/90 FY89: \$71,719 TOTAL: \$329,507
Prin. Invest. NASA Tech. Officer CASE Category
Taam, R. E. HQ-EZ/Clayton, G. C. 13-Physics
HQ-EZ/Weiler, E. J.

NAGW 1609 Northwestern University 3009
High energy astrophysics from the jets in active galactic nuclei
Period Obligations
02/01/89-01/31/90 FY89: \$13,698 TOTAL: \$13,698
Prin. Invest. NASA Tech. Officer CASE Category
Melia, F. HQ-EZ/Kaluzienski, L. J. 11-Astronomy
HQ-EZ/Bunner, A. N.

NAS 1-18877 Northwestern University 3010
Chemical vapor infiltration system
Period Obligations
03/10/89-06/04/90 FY89: \$311,888 TOTAL: \$311,888
Prin. Invest. NASA Tech. Officer CASE Category
Unavailable LARC/Barrett, D. 47-Materials Engr

NAS 8-37686 Northwestern University 3011
Application of hard coatings to substrates at low temperatures
Period Obligations
04/26/89-04/25/92 FY89: \$101,141 TOTAL: \$101,141
Prin. Invest. NASA Tech. Officer CASE Category
Sproul, W. D. MSFC/Thom, R. L. 47-Materials Engr
MSFC/Jett, T. R.

NCA 2-345 Northwestern University 3012
Star formation in violently interacting galaxies
Period Obligations
08/16/88-08/15/89 FY89: TOTAL: \$13,802
Prin. Invest. NASA Tech. Officer CASE Category
Bushouse, H. A. ARC/Werner, M. W. 11-Astronomy
ARC/Smith, B. F.

NCA 2-374 Northwestern University 3013
Analysis of plastic adaptive changes in otolith ocular reflexes
Period Obligations
11/01/88-04/30/90 FY89: \$14,555 TOTAL: \$14,555
Prin. Invest. NASA Tech. Officer CASE Category
Baker, J. F. ARC/Tomko, D. L. 51-Biological Sci
Peterson, B. W.

NGT 00-050-012 Northwestern University 3014
NASA graduate student researchers program
Period Obligations
08/01/86-07/31/88 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Eirich, F. HQ-EB/Rummel, J. 21-Mathematics

NGT 00-050-502 Northwestern University 3015
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Davis, S. H. HQ-XE/Owens, F. C. 21-Mathematics

NAG 2-452 Southern Illinois University - Carbondale 3016
Characterization of neurospora circadian rhythms in space
Period Obligations
02/01/87-10/31/89 FY89: \$136,000 TOTAL: \$242,000
Prin. Invest. NASA Tech. Officer CASE Category
Ferraro, J. S. ARC/Winget, C. M. 51-Biological Sci
ARC/Ballard, R. W.

NAGW 707 Southern Illinois University - Carbondale 3017
Groundwater sapping studies
Period Obligations
02/01/85-12/31/89 FY89: \$3,000 TOTAL: \$62,332
Prin. Invest. NASA Tech. Officer CASE Category
Kochel, R. C. HQ-EL/Underwood, J. R. 32-Geological Sci
HQ-EL/Boyce, J. M.

NCA 2-392 Southern Illinois University - Carbondale 3018
Methods for the analysis of water in the atmosphere of Mars
Period Obligations
03/01/89-02/28/91 FY89: \$17,953 TOTAL: \$17,953
Prin. Invest. NASA Tech. Officer CASE Category
Phillips, J. B. ARC/Valentin, J. R. 12-Chemistry

NAG 2-148 University of Chicago 3019
Physiology of the vestibular system
Period Obligations
12/01/81-01/31/90 FY89: \$15,000 TOTAL: \$390,099
Prin. Invest. NASA Tech. Officer CASE Category
Goldberg, J. M. ARC/Daunton, N. G. 51-Biological Sci
ARC/Corcoran, M. L.

NAG 2-237 University of Chicago 3020
The fossil record of periodic extinction
Period Obligations
05/01/83-11/14/89 FY89: TOTAL: \$194,170
Prin. Invest. NASA Tech. Officer CASE Category
Raup, D. M. ARC/Des Marais, D. J. 51-Biological Sci
Sepkoski, J. J.

NAG 2-380 University of Chicago 3021
Data reduction and analysis for the University of Chicago charged particle instrument on the Pioneer 10 and 11 spacecraft
Period Obligations
10/01/85-10/31/89 FY89: \$320,000 TOTAL: \$1,445,026
Prin. Invest. NASA Tech. Officer CASE Category
Simpson, J. A. ARC/Lasher, L. E. 13-Physics
ARC/Craig, R. A.

NAG 5-255 University of Chicago 3022
Observations of interstellar carbon
Period Obligations
07/15/82-07/15/90 FY89: \$34,400 TOTAL: \$86,125
Prin. Invest. NASA Tech. Officer CASE Category
Hobbs, L. GSFC/Kondo, Y. 11-Astronomy
York, D. G.
Welly, D. E.

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NAG 5-286 University of Chicago 3023
 Absorption measure of gas in galactic holos
Period Obligations
 01/01/83-08/14/90 FY89: \$126,400 TOTAL: \$642,252
Prin. Invest. NASA Tech. Officer CASE Category
 York, D. G. GSFC/West, D. K. 12-Chemistry
 Fowler, J.
 Hobbs, L. M.

NAG 5-308 University of Chicago 3024
 Cosmic ray composition investigations
Period Obligations
 04/01/83-11/30/89 FY89: \$124,590 TOTAL: \$766,689
Prin. Invest. NASA Tech. Officer CASE Category
 Werdenbock, M. E. GSFC/Wales, R. O. 13-Physics
 GSFC/Corrigan, J. P.

NAG 5-394 University of Chicago 3025
 Glaciological field research in west Antorlic
Period Obligations
 02/15/84-09/30/89 FY89: TOTAL: \$68,837
Prin. Invest. NASA Tech. Officer CASE Category
 MacAyeal, D. R. GSFC/Bindschadler, R. A. 32-Geological Sci
 GSFC/Zwally, H. J.

NAG 5-706 University of Chicago 3026
 Research relative to astrophysical studies of IMP satellite data
Period Obligations
 10/01/85-01/14/90 FY89: \$258,609 TOTAL: \$516,719
Prin. Invest. NASA Tech. Officer CASE Category
 Simpson, J. A. GSFC/Wales, R. O. 11-Astronomy
 Munoi, M. G.

NAG 5-873 University of Chicago 3027
 Detection and interpretation of long term atmospheric change
Period Obligations
 02/15/87-02/14/90 FY89: \$53,317 TOTAL: \$150,820
Prin. Invest. NASA Tech. Officer CASE Category
 Frederick, J. E. GSFC/Hilsenrath, E. 31-Atmos Sci

NAG 5-1005 University of Chicago 3028
 Sadap IUE archical research on absorption lines in violently star forming galaxies
Period Obligations
 10/01/87-09/30/88 FY89: TOTAL: \$5,500
Prin. Invest. NASA Tech. Officer CASE Category
 York, D. G. GSFC/Kondo, Y. 11-Astronomy
 Gallagher, J. S.

NAG 5-1056 University of Chicago 3029
 Cloud radiation interactions involving ice clouds and cumulus convection
Period Obligations
 07/01/88-06/30/90 FY89: \$56,844 TOTAL: \$101,912
Prin. Invest. NASA Tech. Officer CASE Category
 Donner, L. J. GSFC/Chou, M. D. 31-Atmos Sci

NAG 5-1086 University of Chicago 3030
 Cosmic ray electron experiment studies-ISEE
Period Obligations
 10/01/88-10/31/89 FY89: \$124,100 TOTAL: \$124,100
Prin. Invest. NASA Tech. Officer CASE Category
 Meyer, P. O. GSFC/Wales, R. O. 11-Astronomy

NAG 5-1177 University of Chicago 3031
 X ray line features of gamma ray bursts
Period Obligations
 07/15/89-07/14/90 FY89: \$29,750 TOTAL: \$29,750
Prin. Invest. NASA Tech. Officer CASE Category
 Lamb, D. Q. GSFC/West, D. 11-Astronomy

NAG 5-1259 University of Chicago 3032
 Studies of stellar X-ray emission, the diffuse X-ray background and stellar evolution
Period Obligations
 09/01/89-02/28/90 FY89: \$20,080 TOTAL: \$20,080
Prin. Invest. NASA Tech. Officer CASE Category
 Rosner, R. GSFC/West, D. 11-Astronomy

NAG 8-732 University of Chicago 3033
 Adp study of magnetic cataclysmic binaries
Period Obligations
 07/01/88-12/31/89 FY89: TOTAL: \$30,000
Prin. Invest. NASA Tech. Officer CASE Category
 Lamb, D. Q. MSFC/Harper, B. A. 11-Astronomy

NAG 9-47 University of Chicago 3034
 Mineralogy and chemistry of planets and meteorites
Period Obligations
 02/01/83-02/01/90 FY89: \$73,500 TOTAL: \$518,500
Prin. Invest. NASA Tech. Officer CASE Category
 Smith, J. V. JSC/Browne, I. D. 13-Physics
 Steele, I. M.

NAG 9-51 University of Chicago 3035
 Isotope studies of the Moon and meteorites
Period Obligations
 02/01/83-12/01/90 FY89: \$256,438 TOTAL: \$1,431,758
Prin. Invest. NASA Tech. Officer CASE Category
 Clayton, R. N. JSC/Browne, I. D. 11-Astronomy
 Mayeda, T. K.
 Hutcheon, I. D.

NAG 9-52 University of Chicago 3036
 Age, origin, and composition of meteorites
Period Obligations
 03/01/83-12/01/89 FY89: \$342,500 TOTAL: \$1,701,000
Prin. Invest. NASA Tech. Officer CASE Category
 Anders, E. JSC/Browne, I. D. 32-Geological Sci
 Lewis, R. S.

NAG 9-54 University of Chicago 3037
 Chemical aspects of the origin of the solar
Period Obligations
 04/01/83-12/01/89 FY89: \$129,502 TOTAL: \$1,165,326
Prin. Invest. NASA Tech. Officer CASE Category
 Grossman, L. JSC/Browne, I. D. 32-Geological Sci

NAG 9-67 University of Chicago 3038
 Thermal models for the Archean
Period Obligations
 02/01/84-02/01/90 FY89: \$31,202 TOTAL: \$185,502
Prin. Invest. NASA Tech. Officer CASE Category
 Richter, F. M. JSC/Browne, I. D. 32-Geological Sci

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NAG 9-106 Development of an X ray fluorescence facility at the national synchrotron light source for research on NASA supported research <i>Period</i> 06/01/86-06/01/90 <i>Prin. Invest.</i> Sutton, S. R.	University of Chicago 3039 <i>Obligations</i> FY89: \$114,400 NASA Tech. Officer JSC/Browne, I. D.	3039 TOTAL: \$441,400 CASE Category 59-Life Sci, NEC	NAGW 1284 Theoretical studies in high energy transients <i>Period</i> 02/01/88-01/31/90 <i>Prin. Invest.</i> Lamb, D. Q.	University of Chicago 3047 <i>Obligations</i> FY89: \$53,975 NASA Tech. Officer HQ-EZ/Clayton, G. C. HQ-ES/Jones, W. V.
NAG 9-296 Oxygen isotope study fluid + melt trans <i>Period</i> 05/01/88-05/01/90 <i>Prin. Invest.</i> Wickham, S.	University of Chicago 3040 <i>Obligations</i> FY89: \$23,000 NASA Tech. Officer JSC/Browne, I. D.	3040 TOTAL: \$46,000 CASE Category 32-Geological Sci	NAGW 1311 Analyze interpretation of high energy cosmic rays measured a spacelab-2 <i>Period</i> 01/01/88-12/31/89 <i>Prin. Invest.</i> Muller, D. Meyer, P.	University of Chicago 3048 <i>Obligations</i> FY89: \$300,000 NASA Tech. Officer HQ-ES/Mellott, M. M. HQ-ES/Jones, W. V.
NAG 9-309 Dust particle calibration of instrumentation for dust particle velocity and trajectory determination <i>Period</i> 09/01/88-06/01/90 <i>Prin. Invest.</i> Simpson, J. A.	University of Chicago 3041 <i>Obligations</i> FY89: NASA Tech. Officer JSC/Horz, F.	3041 TOTAL: \$25,460 CASE Category 49-Engr, NEC	NAGW 1321 Fundamental studies in cosmology <i>Period</i> 02/01/88-01/31/90 <i>Prin. Invest.</i> Schramm, D. N.	University of Chicago 3049 <i>Obligations</i> FY89: \$102,056 NASA Tech. Officer HQ-EZ/Clayton, G. C.
NAGW 762 Statistical analysis of stratospheric ozone and temperature data for trends <i>Period</i> 07/01/85-09/30/88 <i>Prin. Invest.</i> Tiao, G. C.	University of Chicago 3042 <i>Obligations</i> FY89: NASA Tech. Officer HQ-EE/Jackman, C. H. HQ-EE/Butler, D. M.	3042 TOTAL: \$155,000 CASE Category 31-Atmos Sci	NAGW 1328 Cosmic ray measurements of the isotopic composition of matter in the galaxy <i>Period</i> 03/01/88-02/28/90 <i>Prin. Invest.</i> Meyer, P.	University of Chicago 3050 <i>Obligations</i> FY89: \$450,000 NASA Tech. Officer HQ-ES/Mellott, M. M. HQ-ES/Jones, W. V.
NAGW 830 Fundamental studies in high energy astrophysics <i>Period</i> 11/01/85-09/30/89 <i>Prin. Invest.</i> Lamb, D. Q., Jr.	University of Chicago 3043 <i>Obligations</i> FY89: \$112,000 NASA Tech. Officer HQ-EZ/Kaluzienski, L. J. HQ-EZ/Bunner, A. N.	3043 TOTAL: \$345,105 CASE Category 11-Astronomy	NAGW 1475 Accurate ground based calibration of HRS HST absolute wavelengths <i>Period</i> 10/15/88-10/14/89 <i>Prin. Invest.</i> Hobbs, L. M.	University of Chicago 3051 <i>Obligations</i> FY89: \$37,521 NASA Tech. Officer HQ-EZ/Clayton, G. C.
NAGW 873 Interaction of solar ultraviolet radiation (280-400 nm) with terrestrial system <i>Period</i> 02/01/86-09/30/89 <i>Prin. Invest.</i> Frederick, J. E.	University of Chicago 3044 <i>Obligations</i> FY89: NASA Tech. Officer HQ-EE/Miller, T. L. HQ-EE/Prather, M. J.	3044 TOTAL: \$273,244 CASE Category 31-Atmos Sci	NAGW 1508 The history of life in a cosmic environment data base development <i>Period</i> 11/01/88-10/31/89 <i>Prin. Invest.</i> Raup, D. M.	University of Chicago 3052 <i>Obligations</i> FY89: \$59,901 NASA Tech. Officer HQ-EB/Rummel, J. D.
NAGW 878 Adaptation of alpha particle instrument for penetrator on a comet mission <i>Period</i> 03/01/86-09/30/90 <i>Prin. Invest.</i> Turkevich, A.	University of Chicago 3045 <i>Obligations</i> FY89: \$186,187 NASA Tech. Officer HQ-EL/Evans, L. G. HQ-EL/Quaide, W. L.	3045 TOTAL: \$568,527 CASE Category 31-Atmos Sci	NAGW 1527 The fossil record of evolution analysis of extinction <i>Period</i> 11/15/88-11/14/89 <i>Prin. Invest.</i> Raup, D. M.	University of Chicago 3053 <i>Obligations</i> FY89: \$40,357 NASA Tech. Officer HQ-EB/Rummel, J. D.
NAGW 1235 Theoretical program in plasma and MHD processes relevant to the solar outer atmosphere and its analogues <i>Period</i> 01/01/88-07/31/89 <i>Prin. Invest.</i> Rosner, R.	University of Chicago 3046 <i>Obligations</i> FY89: NASA Tech. Officer HQ-EE/Butler, D. M. HQ-EE/Curtis, S. A.	3046 TOTAL: \$170,748 CASE Category 11-Astronomy	NAGW 1636 High energy emission from the jets in active galactic nuclei <i>Period</i> 02/01/89-01/31/90 <i>Prin. Invest.</i> Konigl, A.	University of Chicago 3054 <i>Obligations</i> FY89: \$20,913 NASA Tech. Officer HQ-EZ/Kaluzienski, L. J. HQ-EZ/Bunner, A. N.

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NAGW 1640 University of Chicago 3055
Magnetic field dynamics in the solar interior and outer atmosphere
Period Obligations
01/01/89-09/30/89 FY89: \$145,225 TOTAL: \$145,225
Prin. Invest. NASA Tech. Officer CASE Category
Rosner, R. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Curtis, S. A.

NAGW 1685 University of Chicago 3056
Application of new techniques for solving remote sensing data problems and optimization problems in solar physics
Period Obligations
11/01/88-10/31/89 FY89: \$45,635 TOTAL: \$45,635
Prin. Invest. NASA Tech. Officer CASE Category
Rosner, R. HQ-ES/Bohlin, J. D. 13-Physics
HQ-ES/Kane, S.

NAGW 1693 University of Chicago 3057
The fossil record of evolution data on diversification and extinction
Period Obligations
02/01/89-01/31/90 FY89: \$35,000 TOTAL: \$35,000
Prin. Invest. NASA Tech. Officer CASE Category
Sepkoski, J. J. HQ-EB/Rummel, J. D. 32-Geological Sci

NAGW 1715 University of Chicago 3058
Multifrequency, three-dimensional analysis of the local interstellar medium
Period Obligations
03/01/89-11/30/89 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
York, D. G. HQ-EZ/Clayton, G. C. 11-Astronomy

NAGW 1757 University of Chicago 3059
Definition and development of recoverable instrumentation of dust particle trajectory determination and isotopic and elemental analysis
Period Obligations
01/01/89-10/31/89 FY89: \$208,000 TOTAL: \$208,000
Prin. Invest. NASA Tech. Officer CASE Category
Tuzzolino, A. J. HQ-EL/Mahaffy, P. R. 11-Astronomy

NAS 1-18239 University of Chicago 3060
Halogen occultation experiment (HALOE) \$109,800
Period Obligations
02/20/86-02/19/93 FY89: \$5,000 TOTAL: \$64,000
Prin. Invest. NASA Tech. Officer CASE Category
Frederick, J. E. LARC/Sullivan, E. M. 31-Atmos Sci
LARC/Russell, J. M., III

NAS 1-18385 University of Chicago 3061
Earth radiation budget experiment
Period Obligations
09/30/86-09/30/90 FY89: \$246,500 TOTAL: \$609,645
Prin. Invest. NASA Tech. Officer CASE Category
Ramanathan, V. LARC/Barkstrom, B. R. 31-Atmos Sci

NAS 5-28500 University of Chicago 3062
Data reduction and analysis for ISEE/ICE spacecraft's cosmic ray electron experiment
Period Obligations
11/01/84-12/31/88 FY89: TOTAL: \$505,755
Prin. Invest. NASA Tech. Officer CASE Category
Meyer, P. GSFC/Wales, R. O. 19-Phys Sci, NEC

NAS 5-30117 University of Chicago 3063
Support of the energetic heavy ion composition EHC experiment and the cosmic ray isotope experiment CRIE
Period Obligations
11/16/87-09/30/91 FY89: \$667,000 TOTAL: \$991,500
Prin. Invest. NASA Tech. Officer CASE Category
Simpson, J. A. GSFC/Wales, R. O. 11-Astronomy
Pyle, K. R.
Mundz, M. G.

NASW 3959 University of Chicago 3064
Participation in Vega mission to measure dust particles from Halley's comet
Period Obligations
08/01/84-09/30/89 FY89: TOTAL: \$920,733
Prin. Invest. NASA Tech. Officer CASE Category
Simpson, J. A. HQ-EL/Quaide, W. L. 19-Phys Sci, NEC

NASW 4196 University of Chicago 3065
The definition and development of novel instrumentation for dust and solar system exploration
Period Obligations
01/01/87-12/30/88 FY89: TOTAL: \$200,000
Prin. Invest. NASA Tech. Officer CASE Category
Simpson, J. A. HQ-EL/Gold, R. 31-Atmos Sci
HQ-EL/Evans, L.

NCC 2-265 University of Chicago 3066
Numerical experimental on the dynamics of galaxies
Period Obligations
08/01/83-04/30/90 FY89: \$25,916 TOTAL: \$166,603
Prin. Invest. NASA Tech. Officer CASE Category
Miller, R. H. ARC/Smith, B. F. 11-Astronomy
ARC/Cassen, P. M.

NGL 14-001-001 University of Chicago 3067
Investigation of effects of solar wind in interplanetary space
Period Obligations
08/01/60-12/31/89 FY89: \$153,968 TOTAL: \$2,400,799
Prin. Invest. NASA Tech. Officer CASE Category
Parker, E. N. HQ-ES/Ahluwalia, H. S. 11-Astronomy
HQ-EZ/Bohlin, J. D.

NGL 14-001-005 University of Chicago 3068
High altitude balloon investigations on composition, energy spectrum and intensity of primary cosmic radiation at high and intermediate geomagnetic latitudes
Period Obligations
05/01/61-11/30/89 FY89: \$190,000 TOTAL: \$9,255,626
Prin. Invest. NASA Tech. Officer CASE Category
Meyer, P. HQ-ES/Mellott, M. M. 11-Astronomy
HQ-EZ/Kaluzienski, L. J.

NGL 14-001-006 University of Chicago 3069
Experimental and theoretical studies of energetic particles and electrodynamical processes in interplanetary space and in vicinity of planets
Period Obligations
08/01/61-12/31/89 FY89: \$340,000 TOTAL: \$10,513,416
Prin. Invest. NASA Tech. Officer CASE Category
Simpson, J. A. HQ-ES/Mellott, M. M. 11-Astronomy
HQ-ES/Jones, W. V.

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NGL 14-001-258 University of Chicago 3070
Advanced technical developments in support of scientific experiments in space
Period *Obligations*
06/15/73-03/31/89 FY89: TOTAL: \$3,577,501
Prin. Invest. NASA Tech. Officer CASE Category
Meyer, P. HQ-E/Alexander, J. K. 99-Multi-Disc
Muller, D. HQ-EP/Konkel, R. M.
Simpson, J. A.

NGR 14-001-008 University of Chicago 3071
Meteorological interpretation of satellite radiation data
Period *Obligations*
09/01/70-10/31/89 FY89: \$60,000 TOTAL: \$2,409,000
Prin. Invest. NASA Tech. Officer CASE Category
Fujita, T. T. HQ-EE/Dodge, J. C. 31-Atmos Sci
HQ-EE/Theon, J. S.

NGR 14-001-147 University of Chicago 3072
Interferometric high-resolution spectroscopy of optical interstellar lines
Period *Obligations*
03/18/70-06/30/89 FY89: TOTAL: \$597,603
Prin. Invest. NASA Tech. Officer CASE Category
Hobbs, L. M. HQ-EZ/Weiler, E. J. 11-Astronomy
HQ-EZ/Stachnik, R. V.

NGR 14-001-227 University of Chicago 3073
Photometry of galactic and extragalactic far infrared sources using the 91.5 cm airborne infrared telescope
Period *Obligations*
02/27/73-10/31/89 FY89: \$208,747 TOTAL: \$2,515,371
Prin. Invest. NASA Tech. Officer CASE Category
Harper, D. A., Jr. ARC/Haughney, L. C. 11-Astronomy

NGT 00-050-015 University of Chicago 3074
NASA graduate student researchers program
Period *Obligations*
06/01/86-05/31/89 FY89: TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Anders, E. HQ-LE/Owens, F. C. 12-Chemistry

NGT 00-050-041 University of Chicago 3075
NASA graduate student researchers program
Period *Obligations*
07/01/86-06/30/89 FY89: TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Clayton, R. N. HQ-LE/Owens, F. C. 12-Chemistry

NGT 00-050-059 University of Chicago 3076
NASA graduate student researchers program
Period *Obligations*
09/01/86-08/31/89 FY89: TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
MacAyeal, D. R. HQ-LE/Owens, F. C. 19-Phys Sci, NEC

NGT 00-050-073 University of Chicago 3077
NASA graduate student researchers program
Period *Obligations*
07/01/86-06/30/90 FY89: \$17,815 TOTAL: \$71,815
Prin. Invest. NASA Tech. Officer CASE Category
Hildebrand, R. HQ-LE/Owens, F. C. 11-Astronomy

NGT 00-050-184 University of Chicago 3078
NASA graduate student researchers program
Period *Obligations*
06/22/87-06/21/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Ziegler, A. M. HQ-XE/Owens, F. C. 19-Phys Sci, NEC

NGT 00-050-189 University of Chicago 3079
NASA graduate student researchers program
Period *Obligations*
06/01/87-06/12/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Lamb, D. Q. HQ-XE/Owens, F. C. 11-Astronomy

NGT 00-050-199 University of Chicago 3080
NASA graduate student researchers program
Period *Obligations*
06/22/87-06/21/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Meyer, P. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-203 University of Chicago 3081
NASA graduate student researchers program
Period *Obligations*
06/01/87-05/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Clayton, R. N. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-209 University of Chicago 3082
NASA graduate student researchers program
Period *Obligations*
06/01/87-09/30/88 FY89: TOTAL: \$24,250
Prin. Invest. NASA Tech. Officer CASE Category
Turner, M. S. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-272 University of Chicago 3083
NASA graduate student researchers program
Period *Obligations*
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Dwyer, J. R. HQ-XE/Owens, F. C. 71-Anthropology
Muller, D. HQ-ES/Jones, V.

NGT 00-050-348 University of Chicago 3084
NASA graduate student researchers program
Period *Obligations*
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Miller, R. H. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-449 University of Chicago 3085
NASA graduate student researchers program
Period *Obligations*
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Srivastava, R. C. HQ-XE/Owens, F. C. 19-Phys Sci, NEC

NGT 00-050-453 University of Chicago 3086
NASA graduate student researchers program
Period *Obligations*
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Turner, M. S. HQ-XE/Owens, F. C. 13-Physics

**NASA'S UNIVERSITY PROGRAM
ILLINOIS (Continued)**

NGT 00-050-463	University of Chicago	3087	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
07/01/89-06/30/90	FY89: \$18,000	TOTAL: \$18,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Muller, D.	HQ-XE/Owens, F. C.	49-Engr, NEC	
NGT 00-050-469	University of Chicago	3088	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
07/01/89-06/30/90	FY89: \$18,000	TOTAL: \$18,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Turner, M. S.	HQ-XE/Owens, F. C.	13-Physics	
NGT 14-020-801	University of Chicago	3089	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
04/15/85-08/23/88	FY89:	TOTAL: \$54,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Simpson, J. A.	HQ-LE/Owens, F. C.	13-Physics	
NGT 14-020-802	University of Chicago	3090	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
06/24/85-01/31/90	FY89:	TOTAL: \$72,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Wiedenbeck, M.	HQ-LE/Owens, F. C.	13-Physics	
NGT 14-020-806	University of Chicago	3091	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
07/01/85-12/31/88	FY89: \$4,426	TOTAL: \$49,426	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Clayton, R. N.	HQ-LE/Owens, F. C.	12-Chemistry	
NSG 2057	University of Chicago	3092	Study of sensitive detection system for far infrared astronomy
<i>Period</i>	<i>Obligations</i>		
12/01/74-10/31/89	FY89: \$166,000	TOTAL: \$1,265,544	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hildebrand, R. H.	ARC/Haughney, L. C.	11-Astronomy	
NSG 7464	University of Chicago	3093	Studies of the energy spectrum of cosmic ray electrons
<i>Period</i>	<i>Obligations</i>		
07/01/78-10/31/89	FY89: \$190,353	TOTAL: \$1,089,420	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Muller, D.	HQ-EZ/Jones, W. V.	31-Atmos Sci	
NAG 2-282	University of Illinois - Chicago Circle	3094	The fossil record of evolution: Data on diversification and extinction
<i>Period</i>	<i>Obligations</i>		
02/01/84-01/31/89	FY89:	TOTAL: \$119,100	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Sepkoski Jr., J. J.	ARC/Des Marais, D. J.	51-Biological Sci	
NAG 2-513	University of Illinois - Chicago Circle	3095	The symbolic computation and automated analysis of trajectories of control systems
<i>Period</i>	<i>Obligations</i>		
06/01/88-06/30/90	FY89: \$50,000	TOTAL: \$112,899	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Grossman, R.	ARC/Meyer, G.	49-Engr, NEC	
NAG 2-544	University of Illinois - Chicago Circle	3096	Analytical and numerical scattering from anisotropic structures
<i>Period</i>	<i>Obligations</i>		
08/15/88-06/14/90	FY89: \$32,227	TOTAL: \$61,765	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Uslenghi, P. L.	ARC/Woo, A. C.	45-Elec Engr	
NAG 3-655	University of Illinois - Chicago Circle	3097	Synthesis and tooth contact analysis spar and helical gears with improved criteria
<i>Period</i>	<i>Obligations</i>		
10/01/85-08/01/88	FY89:	TOTAL: \$120,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Litvin, F. L.	LERC/Handschuh, R. F.	46-Mech Engr	
	LERC/Coy, J. J.		
NAG 3-754	University of Illinois - Chicago Circle	3098	Fatigue and associated damage propagation a fundamental approach
<i>Period</i>	<i>Obligations</i>		
11/25/86-10/04/89	FY89:	TOTAL: \$140,378	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Chudnovsky, A.	LERC/Shannon, J. L.	49-Engr, NEC	
NAG 3-783	University of Illinois - Chicago Circle	3099	Influence and compensation for errors of assembly and shaft deflections of spiral bevel gears
<i>Period</i>	<i>Obligations</i>		
04/30/87-09/29/89	FY89:	TOTAL: \$120,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Litvin, F. L.	LERC/Handschuh, R. F.	46-Mech Engr	
	LERC/Coy, J. J.		
NAG 3-796	University of Illinois - Chicago Circle	3100	Comprehensive modeling of turbulent multicomponents fuel sprays
<i>Period</i>	<i>Obligations</i>		
04/15/87-01/12/90	FY89: \$24,186	TOTAL: \$58,992	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Aggarwal, S. K.	LERC/Bulzan, D. L.	46-Mech Engr	
NAG 3-964	University of Illinois - Chicago Circle	3101	Identification of real gear tooth surfaces
<i>Period</i>	<i>Obligations</i>		
12/15/88-12/14/89	FY89: \$60,000	TOTAL: \$60,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Litvin, F. L.	LERC/Handschuh, R. F.	45-Elec Engr	
	LERC/Coy, J. J.		
NAG 3-1034	University of Illinois - Chicago Circle	3102	Probability of brittle failure
<i>Period</i>	<i>Obligations</i>		
04/10/89-02/10/90	FY89: \$67,000	TOTAL: \$67,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Chudnovsky, A.	LERC/Gross, B.	47-Materials Engr	
NAG 8-106	University of Illinois - Chicago Circle	3103	Numerical analysis of bipropellant combustion in orbit maneuvering vehicle thrust chamber
<i>Period</i>	<i>Obligations</i>		
06/17/88-01/17/89	FY89:	TOTAL: \$28,546	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Chire, H. H.	MSFC/Gross, K. W.	49-Engr, NEC	
	MSFC/Thinh, H.		

NASA'S UNIVERSITY PROGRAM **ILLINOIS (Continued)**

NAG 9-111 University of Illinois - Chicago Circle 3104
 Refractory inclusions in c30 carbonaceous chondrites
Period Obligations
 03/01/85-03/01/90 FY89: \$25,000 TOTAL: \$95,800
Prin. Invest. NASA Tech. Officer CASE Category
 Davis, A. M. JSC/Browne, I. D. 32-Geological Sci

NAG 1-602 University of Illinois, Urbana 3105
 Fault propagation experiments for real time systems
Period Obligations
 08/21/85-09/30/89 FY89: \$100,000 TOTAL: \$464,295
Prin. Invest. NASA Tech. Officer CASE Category
 Iyer, R. K. LARC/Carreno, V. A. 22-Computer Science
 LARC/Pitts, F. L.

NAG 1-613 University of Illinois, Urbana 3106
 Aerospace computing systems and software
Period Obligations
 08/21/85-02/20/90 FY89: \$530,000 TOTAL: \$2,156,300
Prin. Invest. NASA Tech. Officer CASE Category
 Liu, J. W. LARC/Bryant, W. H. 22-Computer Science
 Iyer, R. K.

NAG 1-646 University of Illinois, Urbana 3107
 Advanced system architecture for parallel computing
Period Obligations
 05/21/86-12/31/89 FY89: TOTAL: \$152,057
Prin. Invest. NASA Tech. Officer CASE Category
 Lopez, L. A. LARC/Greene, W. H. 49-Engr, NEC
 LARC/Stroud, W. J.

NAG 1-677 University of Illinois, Urbana 3108
 Characteristics of unconventional airfoils
Period Obligations
 04/24/86-09/30/89 FY89: TOTAL: \$106,914
Prin. Invest. NASA Tech. Officer CASE Category
 Chow, W. L. LARC/Sewall, W. G. 41-Aero Engr
 LARC/Harvey, W. D.

NAG 1-1023 University of Illinois, Urbana 3109
 Qualitative modeling for explanation generation and reasoning about procedures in civilian aviation
Period Obligations
 06/01/89-05/31/90 FY89: \$116,146 TOTAL: \$116,146
Prin. Invest. NASA Tech. Officer CASE Category
 Forbus, K. D. LARC/Abbott, K. H. 22-Computer Science
 LARC/Greene, W. R.

NAG 2-308 University of Illinois, Urbana 3110
 Human performance and workload in automated systems
Period Obligations
 08/01/84-10/31/89 FY89: \$118,498 TOTAL: \$649,829
Prin. Invest. NASA Tech. Officer CASE Category
 Wickens, C. D. ARC/Hart, S. G. 69-Psych, NEC
 Anderson, J.

NAG 2-369 University of Illinois, Urbana 3111
 Event related brain potential indices of cognitive workload and automaticity
Period Obligations
 08/01/85-05/31/89 FY89: TOTAL: \$60,072
Prin. Invest. NASA Tech. Officer CASE Category
 Kramer, A. F. ARC/Hart, S. 69-Psych, NEC

NAG 2-466 University of Illinois, Urbana 3112
 The assessment and prediction of mental workload a comparison of physiological behavioral and subjective metrics
Period Obligations
 08/01/87-02/28/90 FY89: \$50,000 TOTAL: \$141,452
Prin. Invest. NASA Tech. Officer CASE Category
 Donchin, E. ARC/Hart, S. G. 69-Psych, NEC
 Kramer, A.
 Coles, M.

NAG 2-567 University of Illinois, Urbana 3113
 Scheduling models for workload prediction and guidance
Period Obligations
 03/01/89-02/28/90 FY89: \$46,012 TOTAL: \$46,012
Prin. Invest. NASA Tech. Officer CASE Category
 Moray, N. ARC/Hart, S. G. 69-Psych, NEC
 Dessouky, M. ARC/Shively, R. J.

NAG 2-584 University of Illinois, Urbana 3114
 Time sharing and huds flying in the dark
Period Obligations
 05/01/89-04/30/90 FY89: \$19,999 TOTAL: \$19,999
Prin. Invest. NASA Tech. Officer CASE Category
 Wickens, C. ARC/Hart, S. G. 69-Psych, NEC

NAG 2-602 University of Illinois, Urbana 3115
 Hydrogen compatibility of advanced structural materials
Period Obligations
 06/01/89-05/31/90 FY89: \$150,000 TOTAL: \$150,000
Prin. Invest. NASA Tech. Officer CASE Category
 Robertson, I. M. ARC/Panontin, T. L. 47-Materials Engr
 Birnbaum, H. K. ARC/Nelson, H.

NAG 3-419 University of Illinois, Urbana 3116
 Selected studies of reflector antenna systems
Period Obligations
 05/21/83-05/20/90 FY89: \$62,636 TOTAL: \$360,729
Prin. Invest. NASA Tech. Officer CASE Category
 Lee, S. W. LERC/Acosta, R. J. 45-Elec Engr

NAG 3-475 University of Illinois, Urbana 3117
 Numerical methods for analyzing electromagnetic scattering
Period Obligations
 07/13/87-01/04/90 FY89: \$78,220 TOTAL: \$428,545
Prin. Invest. NASA Tech. Officer CASE Category
 Lee, S. W. LERC/Rice, E. J. 45-Elec Engr
 Lo, Y. T.
 Chuang, S. L.

NAG 3-591 University of Illinois, Urbana 3118
 Investigation of polycrystalline vanadium oxide films deposited by magnetron reactive sputtering and their application to thermal control surface for space power systems
Period Obligations
 12/10/84-09/30/88 FY89: TOTAL: \$157,154
Prin. Invest. NASA Tech. Officer CASE Category
 Thornton, J. LERC/Mirtich, M. J. 13-Physics
 LERC/Banks, B. A.

NAG 3-613 University of Illinois, Urbana 3119
 Electron transport in new material quantum well structures for microwave devices
Period Obligations
 04/30/85-06/15/89 FY89: TOTAL: \$294,524
Prin. Invest. NASA Tech. Officer CASE Category
 Morkoc, H. LERC/Alterovitz, S. A. 45-Elec Engr

NASA'S UNIVERSITY PROGRAM
ILLINOIS (Continued)

NAG 3-741 University of Illinois, Urbana 3120
 Gas discharge particle simulations for modeling surface flash over on spacecraft
Period *Obligations*
 09/01/86-02/14/90 FY89: TOTAL: \$214,549
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Kushner, M. J. LERC/Purvis, C. K. 19-Phys Sci, NEC

NAG 3-798 University of Illinois, Urbana 3121
 Nondestructing evaluation characterization of advanced ceramic matrix composites
Period *Obligations*
 06/01/87-04/30/89 FY89: TOTAL: \$39,941
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Dos Reis, H. L. LERC/Klima, S. J. 47-Materials Engr

NAG 3-805 University of Illinois, Urbana 3122
 Optional low thrust time constrained orbital rendezvous
Period *Obligations*
 08/27/87-08/28/89 FY89: TOTAL: \$156,943
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Conway, B. A. LERC/Mulac, M. W. 42-Astro Engr
 Prussing, J. E. LERC/Spurlock, O. F.

NAG 3-947 University of Illinois, Urbana 3123
 Mathematical model of events
Period *Obligations*
 10/15/88-10/14/90 FY89: \$39,883 TOTAL: \$39,883
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Dantzig, J. A. LERC/Chait, A. 47-Materials Engr

NAG 3-1026 University of Illinois, Urbana 3124
 Numerical investigation of hot gas ingestion by VSTOL aircraft
Period *Obligations*
 04/03/89-04/02/93 FY89: \$137,155 TOTAL: \$137,155
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Vanka, S. P. LERC/Holdeman, J. D. 41-Aero Engr

NAG 3-1037 University of Illinois, Urbana 3125
 Spaceborne centrifugal relays
Period *Obligations*
 04/21/89-05/20/90 FY89: \$24,705 TOTAL: \$24,705
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Singer, C. E. LERC/Byers, D. C. 42-Astro Engr
 LERC/Sovey, J. S.

NAG 3-1074 University of Illinois, Urbana 3126
 Three dimensional grid adaption to geometry and flow solutions
Period *Obligations*
 09/08/89-03/07/90 FY89: \$20,000 TOTAL: \$20,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Lee, K. D. LERC/Choo, Y. K. 41-Aero Engr

NAG 5-1064 University of Illinois, Urbana 3127
 Winds from planetary nebula nuclei
Period *Obligations*
 07/15/88-07/14/89 FY89: TOTAL: \$12,074
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Kaler, J. GSFC/Kondo, Y. 11-Astronomy

NAG 5-1110 University of Illinois, Urbana 3128
 Ultraviolet spectroscopy of young stellar populations in interacting galaxies
Period *Obligations*
 01/01/89-12/31/89 FY89: \$9,000 TOTAL: \$9,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Lamb, S. GSFC/Kondo, Y. 11-Astronomy

NAG 5-1241 University of Illinois, Urbana 3129
 High resolution studies and modeling of closely interacting galaxies
Period *Obligations*
 08/15/89-02/14/90 FY89: \$19,200 TOTAL: \$19,200
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Lamb, S. A. GSFC/West, D. 11-Astronomy

NAG 8-59 University of Illinois, Urbana 3130
 Application of satellite data in variational analysis for global cyclonic system
Period *Obligations*
 03/25/86-03/25/90 FY89: TOTAL: \$497,450
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Actemeir, G. L. MSFC/Kaufman, J. W. 31-Atmos Sci
 MSFC/Smith, G. T.

NAG 9-137 University of Illinois, Urbana 3131
 Qualitative models for space system engineering
Period *Obligations*
 05/21/86-01/01/90 FY89: TOTAL: \$197,931
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Forbus, K. D. JSC/Malin, J. T. 42-Astro Engr

NAGW 992 University of Illinois, Urbana 3132
 Continued research spacelab 1 TSO data
Period *Obligations*
 11/01/86-10/31/89 FY89: TOTAL: \$100,977
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Bowman, K. P. HQ-EE/Jackman, C. H. 31-Atmos Sci
 HQ-EE/Butler, D. M.

NAGW 1104 University of Illinois, Urbana 3133
 Microphysical theory of diffuse astronomical environments
Period *Obligations*
 06/01/87-05/31/90 FY89: \$55,000 TOTAL: \$155,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Watson, W. D. HQ-EZ/Brinton, H. C. 11-Astronomy
 HQ-EZ/Stachnik, R. V.

NAGW 1131 University of Illinois, Urbana 3134
 Radio astronomical studies of comets with the very large array
Period *Obligations*
 07/01/87-12/31/89 FY89: \$51,487 TOTAL: \$133,180
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Snyder, L. E. HQ-EL/Gillett, F. C. 11-Astronomy
 HQ-EL/Rahe, J. H.

NAGW 1389 University of Illinois, Urbana 3135
 Multiyear sea ice concentration model and satellite derived
Period *Obligations*
 07/01/88-06/30/89 FY89: TOTAL: \$45,473
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Walsh, J. E. HQ-EE/Thomas, R. H. 33-Oceanography
 HQ-EE/Wilson, W. S.

NASA'S UNIVERSITY PROGRAM
ILLINOIS (Continued)

NAGW 1583		University of Illinois, Urbana	3136	NCA 2-368		University of Illinois, Urbana	3144
Theoretical X ray astronomy				Galaxy collisions infrared observations and analysis of numerical models			
<i>Period</i>		<i>Obligations</i>		<i>Period</i>		<i>Obligations</i>	
11/01/88-10/31/89	FY89: \$115,000	TOTAL: \$115,000		11/01/88-10/31/89	FY89: \$26,299	TOTAL: \$26,299	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Lamb, F. K.	HQ-EZ/Kaluzienski, L. J.	11-Astronomy		Lamb, S. A.	ARC/Werner, M. W.	13-Physics	
	HQ-EZ/Bunner, A. N.				ARC/Smith, B. F.		
NAGW 1683		University of Illinois, Urbana	3137	NCA 2-385		University of Illinois, Urbana	3145
Numerical methods for free and moving boundary problems				Distributed simulation environment for Fault tolerance in high performance architectures			
<i>Period</i>		<i>Obligations</i>		<i>Period</i>		<i>Obligations</i>	
03/01/89-02/28/90	FY89: \$59,117	TOTAL: \$59,117		03/01/89-10/31/89	FY89: \$40,000	TOTAL: \$40,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Dantzig, J. A.	HQ-E/Alexander, J. K.	47-Materials Engr		Iyer, R. K.	ARC/Lum, H.	22-Computer Science	
	HQ-E/Holland, D. A.						
NAGW 1729		University of Illinois, Urbana	3138	NCA 2-433		University of Illinois, Urbana	3146
Dynamics of stratospheric planetary waves				New computational scheme for physical optics based radar-cross-section analysis			
<i>Period</i>		<i>Obligations</i>		<i>Period</i>		<i>Obligations</i>	
03/01/89-02/28/90	FY89: \$50,000	TOTAL: \$50,000		07/15/89-07/14/91	FY89: \$40,000	TOTAL: \$40,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Robinson, W. A.	HQ-EE/McPeters, R. D.	31-Atmos Sci		Lee, S. W.	ARC/Woo, A.	41-Aero Engr	
	HQ-EE/Prather, M. J.						
NAS 5-28781		University of Illinois, Urbana	3139	NCC 2-380		University of Illinois, Urbana	3147
Interpreting forest and grassland biome productivity utilizing nested scales of image resolution and biogeographical analysis				Workload and training: An examination of their interactions			
<i>Period</i>		<i>Obligations</i>		<i>Period</i>		<i>Obligations</i>	
08/09/85-04/09/88	FY89:	TOTAL: \$199,994		10/01/85-01/31/90	FY89: \$42,156	TOTAL: \$152,147	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Iverson, L.	GSFC/Oseroff, H.	32-Geological Sci		Donchin, E.	ARC/Hart, S. G.	69-Psych, NEC	
					ARC/Hartzell, E. J.		
NAS10-11153		University of Illinois, Urbana	3140	NCC 2-481		University of Illinois, Urbana	3148
Study of liquid vapor				Efficient evaluation of A1 programs			
<i>Period</i>		<i>Obligations</i>		<i>Period</i>		<i>Obligations</i>	
02/05/85-08/22/90	FY89: \$89,848	TOTAL: \$517,341		01/01/87-12/31/89	FY89: \$152,735	TOTAL: \$333,270	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Chao, B. T.	KSC/Lin, F. N.	39-Env Sci, NEC		Wah, B. W.	ARC/Lum, H.	22-Computer Science	
Soo, S. L.					ARC/McKellar, D.		
NCA 2-92		University of Illinois, Urbana	3141	NCC 2-559		University of Illinois, Urbana	3149
An alternative formulation for Euler solutions by improving convection fidelity				Architecture and compiler design and evaluation facilities			
<i>Period</i>		<i>Obligations</i>		<i>Period</i>		<i>Obligations</i>	
10/01/85-06/30/88	FY89:	TOTAL: \$80,000		08/01/88-04/30/90	FY89: \$885,486	TOTAL: \$1,035,486	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Lee, K. D.	ARC/Erickson, L. L.	41-Aero Engr		Kuck, D. J.	ARC/Lum, H.	22-Computer Science	
				Lawrie, D.	ARC/McKellar, D.		
				Sameh, A.			
NCA 2-165		University of Illinois, Urbana	3142	NCC 2-613		University of Illinois, Urbana	3150
The infrared emission properties of pairs of interacting galaxies				Spatial orientation from 3-D virtual displays			
<i>Period</i>		<i>Obligations</i>		<i>Period</i>		<i>Obligations</i>	
09/15/86-09/14/88	FY89:	TOTAL: \$37,619		05/01/89-10/31/89	FY89: \$9,795	TOTAL: \$9,795	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Lamb, S. A.	ARC/Werner, M. W.	11-Astronomy		Andersen, G. J.	ARC/Johnson, W. W.	69-Psych, NEC	
	ARC/Smith, B. F.						
NCA 2-301		University of Illinois, Urbana	3143	NCC 2-631		University of Illinois, Urbana	3151
A proposal for an integrated data analysis and model extraction facility				Shapa an interactive protocol analysis tool for modeling crew communication and workload			
<i>Period</i>		<i>Obligations</i>		<i>Period</i>		<i>Obligations</i>	
05/01/88-12/15/89	FY89: \$40,000	TOTAL: \$80,000		06/01/89-11/30/89	FY89: \$25,000	TOTAL: \$25,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Iyer, R. K.	ARC/Grant, T. L.	22-Computer Science		Sanderson, P. M.	ARC/Palmer, E. A.	49-Engr, NEC	
					ARC/Hart, S. G.		

**NASA'S UNIVERSITY PROGRAM
ILLINOIS (Continued)**

NCC 2-632 University of Illinois, Urbana 3152
Context, computation, and complexity: Applications to aviation display system
Period *Obligations*
08/15/89-01/14/90 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wickens, C. D. ARC/Hartzell, E. J. 69-Psych, NEC

NGR 14-005-181 University of Illinois, Urbana 3153
Rocket studies of the lower ionosphere
Period *Obligations*
08/01/71-02/28/89 FY89: TOTAL: \$6,325,062
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bowhill, S. A. GSFC/Early, L. J. 19-Phys Sci, NEC
GSFC/Pless, R. H.

NGT 00-050-152 University of Illinois, Urbana 3154
NASA graduate student researchers program
Period *Obligations*
06/01/87-07/31/89 FY89: TOTAL: \$32,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Dickel, J. R. HQ-XE/Owens, F. C. 11-Astronomy

NGT 00-050-349 University of Illinois, Urbana 3155
NASA graduate student researchers program
Period *Obligations*
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wah, B. HQ-XE/Owens, F. C. 22-Computer Science

NGT 00-050-356 University of Illinois, Urbana 3156
NASA graduate student researchers program
Period *Obligations*
09/01/88-08/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bentsman, J. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 00-050-363 University of Illinois, Urbana 3157
NASA graduate student researchers program
Period *Obligations*
08/21/88-08/20/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Beddini, R. A. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 00-050-384 University of Illinois, Urbana 3158
NASA graduate student researchers program
Period *Obligations*
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Dutton, J. C. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 00-050-442 University of Illinois, Urbana 3159
NASA graduate student researchers program
Period *Obligations*
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wan, B. HQ-XE/Owens, F. C. 22-Computer Science

NGT 00-070-038 University of Illinois, Urbana 3160
Graduate student researchers underrepresented minority focus program
Period *Obligations*
08/24/87-08/23/89 FY89: TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lee, S. W. HQ-XE/Owens, F. C. 45-Elec Engr

NGT 00-070-041 University of Illinois, Urbana 3161
Graduate student researchers underrepresented minority focus program
Period *Obligations*
08/21/87-08/20/89 FY89: TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lamb, S. A. HQ-XE/Owens, F. C. 13-Physics

NGT 00-070-042 University of Illinois, Urbana 3162
Graduate student researchers underrepresented minority focus program
Period *Obligations*
09/01/87-08/31/89 FY89: \$12,000 TOTAL: \$30,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lo, Y. T. HQ-XE/Owens, F. C. 45-Elec Engr

NGT 00-070-107 University of Illinois, Urbana 3163
Graduate student researchers underrepresented minority focus program
Period *Obligations*
12/01/88-11/30/89 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Kushner, M. J. HQ-XE/Owens, F. C. 45-Elec Engr

NSG 1471 University of Illinois, Urbana 3164
A project to investigate mechanisms and methodologies for the design and construction of reliable, distributed programs in real-time environments
Period *Obligations*
11/15/77-11/30/89 FY89: \$47,000 TOTAL: \$787,843
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Campbell, R. H. LARC/Murray, N. D. 21-Mathematics
LARC/Will, R. W.

NSG 5049 University of Illinois, Urbana 3165
Effects of atmospheric refraction and turbulence on the accuracy of laser systems
Period *Obligations*
02/01/75-01/31/90 FY89: \$54,674 TOTAL: \$661,673
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Gardner, C. S. GSFC/Abshire, J. B. 45-Elec Engr
Swenson, G. W. GSFC/Zimmerman, R. T.

NSG 7044 University of Illinois, Urbana 3166
Evolution of the cell and the translation process
Period *Obligations*
06/01/74-12/31/89 FY89: \$106,000 TOTAL: \$1,248,730
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Woese, C. R. HQ-EB/Fogleman, S. W. 12-Chemistry
HQ-EB/Rummel, J. D.

NSG 7653 University of Illinois, Urbana 3167
Fundamental studies in theoretical X-ray astronomy
Period *Obligations*
09/01/79-10/31/88 FY89: \$55,900 TOTAL: \$1,021,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lamb, F. K. HQ-EZ/Kaluzienski, L. 11-Astronomy
Pethick, C. J. HQ-EZ/Bunner, A. N.
Pines, D.

NASA'S UNIVERSITY PROGRAM INDIANA

INDIANA

NAG 8-722 De Pauw University 3168
Advanced schlieren analysis project
Period *Obligations*
06/01/88-08/31/90 FY89: \$20,000 TOTAL: \$64,000
Prin. Invest. NASA Tech. Officer CASE Category
Brooks, H. L. MSFC/Denton, T. L. 13-Physics
MSFC/Ralston, W. S.

NAG 2-498 Indiana State University 3169
Basic gravitational reflexes in the larval frog
Period *Obligations*
03/01/88-02/28/90 FY89: \$45,000 TOTAL: \$92,520
Prin. Invest. NASA Tech. Officer CASE Category
Cochran, S. L. ARC/Ross, M. D. 51-Biological Sci
ARC/Holton, E.

NAG 3-952 Indiana State University 3170
Electron spin resonance studies of PMR 15
Period *Obligations*
12/01/88-11/30/89 FY89: \$18,400 TOTAL: \$18,400
Prin. Invest. NASA Tech. Officer CASE Category
Ahn, M. K. LERC/Bowles, K. J. 47-Materials Engr

NAG 2-323 Indiana University - Bloomington 3171
Gravity perturbations as a probe for analyzing pattern specification in early amphibian embryogenesis
Period *Obligations*
12/01/84-09/30/89 FY89: TOTAL: \$219,140
Prin. Invest. NASA Tech. Officer CASE Category
Malacinski, G. M. ARC/Souza, K. A. 51-Biological Sci
ARC/Ross, M.

NAG 2-512 Indiana University - Bloomington 3172
Ballistic transport in ring systems due to meteoroid erosion
Period *Obligations*
06/01/88-05/31/90 FY89: \$16,004 TOTAL: \$27,804
Prin. Invest. NASA Tech. Officer CASE Category
Durisen, R. H. ARC/Cuzzi, J. N. 11-Astronomy

NAG 2-550 Indiana University - Bloomington 3173
Ionic mechanisms subserving mechanosensory transduction and neural integration in statocyst hair cells of hermissenda
Period *Obligations*
07/01/88-10/31/89 FY89: \$15,089 TOTAL: \$15,089
Prin. Invest. NASA Tech. Officer CASE Category
Farley, J. ARC/Ross, M. D. 51-Biological Sci

NAG 3-1014 Indiana University - Bloomington 3174
Fluid absorption solar energy receivers technology employing halogen gases
Period *Obligations*
02/09/89-05/08/90 FY89: \$25,000 TOTAL: \$25,000
Prin. Invest. NASA Tech. Officer CASE Category
Bair, E. J. LERC/Dustin, M. O. 46-Mech Engr
Langhoff, P. W.

NAG 5-182 Indiana University - Bloomington 3175
Studies of the ultraviolet spectra of carbon stars
Period *Obligations*
05/15/81-08/31/90 FY89: \$31,400 TOTAL: \$195,519
Prin. Invest. NASA Tech. Officer CASE Category
Johnson, H. R. GSFC/West, D. 11-Astronomy
Eaton, J. A.
Avrett, E. H.

NAG 5-599 Indiana University - Bloomington 3176
Ultraviolet observations of astronomical sources
Period *Obligations*
09/01/85-08/31/90 FY89: TOTAL: \$167,800
Prin. Invest. NASA Tech. Officer CASE Category
Eaton, J. GSFC/Kondo, Y. 11-Astronomy
Johnson, H. R.

NAG 5-721 Indiana University - Bloomington 3177
Charged particle radiation damage of germanium detectors
Period *Obligations*
12/01/85-11/30/89 FY89: TOTAL: \$150,000
Prin. Invest. NASA Tech. Officer CASE Category
Friesel, D. GSFC/Trombka, J. L. 19-Phys Sci, NEC
Pehl, R.

NAG 5-962 Indiana University - Bloomington 3178
/UE/IRAS studies of collapsed-core globular clusters
Period *Obligations*
07/14/87-07/13/88 FY89: TOTAL: \$10,003
Prin. Invest. NASA Tech. Officer CASE Category
Lugger, P. GSFC/Kondo, Y. 11-Astronomy

NAG 8-589 Indiana University - Bloomington 3179
A search for multiple X ray sources in the cores of high X ray luminosity globular clusters
Period *Obligations*
06/01/86-05/31/88 FY89: TOTAL: \$24,586
Prin. Invest. NASA Tech. Officer CASE Category
Cohn, H. N. MSFC/Potter, P. 11-Astronomy
Lugger, P. M.

NAGW 1035 Indiana University - Bloomington 3180
Superconducting magnet instrument for light isotopes
Period *Obligations*
02/15/87-11/30/89 FY89: \$75,000 TOTAL: \$200,000
Prin. Invest. NASA Tech. Officer CASE Category
Heinz, R. M. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Jones, W. V.

NAGW 1548 Indiana University - Bloomington 3181
Gravity as a probe for understanding embryonic pattern specification in amphibian and fish model systems
Period *Obligations*
12/01/88-11/30/89 FY89: \$60,000 TOTAL: \$60,000
Prin. Invest. NASA Tech. Officer CASE Category
Malacinski, G. M. HQ-EB/Halstead, T. W. 51-Biological Sci

NAGW 1670 Indiana University - Bloomington 3182
The electronic spectroscopy of HO2 radicals
Period *Obligations*
02/01/89-01/31/90 FY89: \$41,748 TOTAL: \$41,748
Prin. Invest. NASA Tech. Officer CASE Category
Reilly, J. P. HQ-EE/Kurylo, M. J. 31-Atmos Sci
HQ-EE/Watson, R. T.

NASA'S UNIVERSITY PROGRAM
INDIANA (Continued)

NAGW 1682 Indiana University - Bloomington 3183
 The rob of the U.S. Government technical report in aeronautics and
 exploratory study
Period *Obligations*
 01/15/89-10/31/90 FY89: \$125,785 TOTAL: \$125,785
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Pinelli, T. E. HQ-RF/Graves, R. 79-Soc Sci, NEC
 Kennedy, J. M. HQ/Phillips, J. B.
 White, H. S.

NGR 15-003-118 Indiana University - Bloomington 3184
 Application of ultra-high sensitivity isotope ratio mass spectrometry to
 organic geochemistry and cosmochemistry
Period *Obligations*
 06/20/72-11/30/89 FY89: \$120,000 TOTAL: \$1,568,312
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Hayes, J. M. HQ-EB/Rummel, J. 12-Chemistry
 HQ-EB/Rambler, M. B.

NGT 00-050-237 Indiana University - Bloomington 3185
 NASA graduate student researchers program
Period *Obligations*
 09/01/87-08/31/90 FY89: \$36,000 TOTAL: \$54,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Hayes, J. M. HQ-XE/Owens, F. C. 12-Chemistry
 HQ-EE/Watson, R. T.

NGT 00-050-298 Indiana University - Bloomington 3186
 NASA graduate student researchers program
Period *Obligations*
 08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$33,340
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Heinz, R. M. HQ-XE/Owens, F. C. 13-Physics

NSG 9077 Indiana University - Bloomington 3187
 Characterization and evolution of Apollo 15 drill core soils, and the
 origin of green glass vitrophyres
Period *Obligations*
 07/15/79-03/01/90 FY89: \$26,550 TOTAL: \$268,683
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Basu, A. JSC/Browne, I. D. 32-Geological Sci

NCC 2-594 Indiana Univ.-Purdue U. at Indianapolis 3188
 Cell kinetic and histomorphometric analysis of microgravitational
 osteopenia
Period *Obligations*
 11/01/88-10/31/89 FY89: \$60,000 TOTAL: \$60,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Roberts, W. E. ARC/Holton, E. M. 51-Biological Sci

NAG 1-58 Purdue University 3189
 A study of method to predict and measure the transmission of sound
 through the walls of light aircraft
Period *Obligations*
 04/01/80-04/30/90 FY89: \$80,000 TOTAL: \$821,977
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Bernhard, R. J. LARC/Silcox, R. J. 41-Aero Engr
 LARC/Powell, C. A.

NAG 1-157 Purdue University 3190
 Interactive aircraft flight control and aeroelastic stabilization
Period *Obligations*
 05/01/81-01/31/90 FY89: \$67,535 TOTAL: \$455,409
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Weisshaar, T. A. LARC/Perry, B. 41-Aero Engr
 Schmidt, D. K.

NAG 1-372 Purdue University 3191
 Computational unsteady aerodynamics and aeroelasticity
Period *Obligations*
 06/07/83-07/31/91 FY89: \$75,000 TOTAL: \$456,611
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Yang, H. T. LARC/Edwards, J. W. 41-Aero Engr
 Williams, M. LARC/Batina, J. T.
 Weisshaar, T. A.

NAG 1-552 Purdue University 3192
 First international satellite cloud climatology project regional experiment
 (FIRE) related study
Period *Obligations*
 12/14/84-02/28/89 FY89: TOTAL: \$95,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Smith, P. J. LARC/Owens, T. L. 31-Atmos Sci

NAG 1-676 Purdue University 3193
 Design of an adaptable distributed system
Period *Obligations*
 05/01/86-04/30/90 FY89: \$120,281 TOTAL: \$472,770
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Bhargava, B. LARC/Murray, N. D. 22-Computer Science

NAG 1-758 Purdue University 3194
 Dynamic modeling of flexible aerospace vehicles
Period *Obligations*
 05/01/87-08/31/90 FY89: TOTAL: \$120,775
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Schmidt, D. K. LARC/Arbuckle, P. D. 41-Aero Engr
 LARC/Elliott, J. R.

NAG 1-825 Purdue University 3195
 Characterization of viscoplastic behavior of graphite peek APC II
 composites
Period *Obligations*
 11/01/87-01/31/90 FY89: \$55,000 TOTAL: \$125,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Sun, C. T. LARC/Bigelow, C. A. 46-Mech Engr
 LARC/Whitcomb, J. D.

NAG 1-854 Purdue University 3196
 Hypervelocity scramjet nozzle analysis and design
Period *Obligations*
 02/15/88-02/28/90 FY89: \$125,000 TOTAL: \$252,500
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Thompson, H. D. LARC/Weidner, J. P. 46-Mech Engr
 Hoffman, J. D. LARC/Mackley, E. A.

NAG 1-857 Purdue University 3197
 Sensitivity optimal scaling and minimum roundoff errors in flexible structure
 models
Period *Obligations*
 03/01/88-02/28/90 FY89: \$80,000 TOTAL: \$130,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Skelton, R. E. LARC/Armstrong, E. S. 41-Aero Engr
 LARC/Joshi, S. M.

NAG 1-958 Purdue University 3198
 Controls structures interaction guest investigator program
Period *Obligations*
 02/01/89-01/31/91 FY89: \$236,000 TOTAL: \$236,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Skelton, R. E. LARC/Taylor, R. S. 42-Astro Engr
 LARC/Joshi, S. M.

NASA'S UNIVERSITY PROGRAM **INDIANA (Continued)**

NAG 2-468	Purdue University	3199	State detailed dynamics of energetic half collisions terminating in electronically excited diatomics of nitrogen and oxygen
<i>Period</i>	<i>Obligations</i>		
04/15/87-04/14/90	FY89: \$50,000	TOTAL: \$146,429	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Grant, E. R.	ARC/Jaffe, R. L.	13-Physics	
NAG 3-360	Purdue University	3200	The role of hydroxyl radical in the chemistry of soot formation
<i>Period</i>	<i>Obligations</i>		
12/15/82-03/31/89	FY89:	TOTAL: \$219,249	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Laurendeau, N. M.	LERC/Lezberg, E.	12-Chemistry	
King, G. B.	LERC/Haggard, J.		
NAG 3-481	Purdue University	3201	Dynamic performance of high bypass ratio turbine engines with water ingestion
<i>Period</i>	<i>Obligations</i>		
10/31/83-08/30/90	FY89: \$110,000	TOTAL: \$369,703	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Murthy, S. N.	LERC/Steinke, R. J.	41-Aero Engr	
NAG 3-499	Purdue University	3202	Aeroelasticity of advanced turboprops using three dimensional unsteady aerodynamics
<i>Period</i>	<i>Obligations</i>		
12/15/83-04/28/90	FY89: \$80,000	TOTAL: \$381,674	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Williams, M. H.	LERC/Stefko, G. L.	41-Aero Engr	
	LERC/Kiraly, L. J.		
NAG 3-552	Purdue University	3203	Influence of fuel thermal stability on atomizer design and performance
<i>Period</i>	<i>Obligations</i>		
09/15/84-02/27/90	FY89: \$59,997	TOTAL: \$316,603	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Lefebvre, A. F.	LERC/Rollbuhler, R. J.	46-Mech Engr	
	LERC/Niedzwiecki, R. W.		
NAG 3-599	Purdue University	3204	A predictive model for failure properties of thermoset resins
<i>Period</i>	<i>Obligations</i>		
01/05/85-02/02/89	FY89:	TOTAL: \$180,575	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Caruthers, J. M.	LERC/Bowles, K. A.	47-Materials Engr	
NAG 3-656	Purdue University	3205	3-D unsteady aerodynamics and aeroelasticity of advanced turboprops
<i>Period</i>	<i>Obligations</i>		
11/01/85-10/31/90	FY89: \$169,173	TOTAL: \$411,509	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Fleeter, P. S.	LERC/Hoyniak, D.	41-Aero Engr	
NAG 3-825	Purdue University	3206	Compendium of the aeromechanics of gas turbine engines
<i>Period</i>	<i>Obligations</i>		
10/20/87-12/19/89	FY89: \$76,981	TOTAL: \$153,600	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Fleeter, S.	LERC/Newman, F. A.	41-Aero Engr	
NAG 3-848	Purdue University	3207	Modeling and simulation of an advanced solar dynamic photovoltaic spacecraft power system
<i>Period</i>	<i>Obligations</i>		
12/05/87-08/05/88	FY89:	TOTAL: \$46,917	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Wasynczuk, O.	LERC/Truong, L. V.	45-Elec Engr	
	LERC/Sundberg, G. R.		
NAG 3-858	Purdue University	3208	Solution of flows through multistage turbomachinery using parallel processing techniques
<i>Period</i>	<i>Obligations</i>		
01/05/88-01/14/90	FY89: \$40,894	TOTAL: \$78,332	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Ecer, A.	LERC/Blech, R. A.	49-Engr, NEC	
Akay, H. U.	LERC/Szuch, J. R.		
NAG 3-875	Purdue University	3209	Multi grid acceleration method for the solution of the average passage equations
<i>Period</i>	<i>Obligations</i>		
02/20/88-05/09/90	FY89:	TOTAL: \$38,142	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Usab, W. J.	LERC/Adamczyk, J. J.	41-Aero Engr	
NAG 3-943	Purdue University	3210	Hot gas injection
<i>Period</i>	<i>Obligations</i>		
12/01/88-11/30/90	FY89: \$170,000	TOTAL: \$170,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Sullivan, J. P.	LERC/Holdeman, J. D.	41-Aero Engr	
Murthy, S. N.			
NAG 3-977	Purdue University	3211	Preparation electrochemistry and photochemistry a organic and organometallic conducting polymers
<i>Period</i>	<i>Obligations</i>		
02/01/89-08/01/90	FY89: \$60,000	TOTAL: \$60,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Kubiak, C. P.	LERC/Meador, M. A.	12-Chemistry	
NAG 3-1038	Purdue University	3212	Measurement of species concentrations and temperature in axisymmetric premixed flames by laser induced fluorescence
<i>Period</i>	<i>Obligations</i>		
07/01/89-01/31/90	FY89: \$59,824	TOTAL: \$59,824	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Laurendeau, N. M.	LERC/Hicks, Y. R.	49-Engr, NEC	
NAG 3-1057	Purdue University	3213	Support of 9th international symposium on air breathing engines (ISOABE) and related activities of the national organizing committee
<i>Period</i>	<i>Obligations</i>		
06/28/89-06/27/90	FY89: \$5,454	TOTAL: \$5,454	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Murthy, S. N.	LERC/Hartmann, M. J.	99-Multi-Discip	
NAG 4-1	Purdue University	3214	The integrated manual and automatic control of complex flight vehicles
<i>Period</i>	<i>Obligations</i>		
01/01/80-04/30/89	FY89:	TOTAL: \$410,921	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Schmidt, D. K.	ARC/Berry, D. T.	41-Aero Engr	
	ARC/Powers, B. G.		

NASA'S UNIVERSITY PROGRAM **INDIANA (Continued)**

NAG 5-101 **Purdue University** **3215**
Study the effect of cloud inhomogeneity on the Earth radiation budget
Period *Obligations*
09/01/80-08/31/88 FY89: TOTAL: \$244,000
Prin. Invest. NASA Tech. Officer CASE Category
Smith, P. G. GSFC/Curran, R. J. 31-Atmos Sci
GSFC/King, M. D.

NAG 5-1088 **Purdue University** **3216**
Parameterization cloudiness climate models analysis radiation
Period *Obligations*
10/01/88-12/31/89 FY89: TOTAL: \$30,831
Prin. Invest. NASA Tech. Officer CASE Category
Harshvardhan GSFC/Thiele, O. W. 31-Atmos Sci

NAG 5-1125 **Purdue University** **3217**
The role of global cloud climatologies in validating numerical models
Period *Obligations*
04/01/89-03/31/90 FY89: \$80,000 TOTAL: \$80,000
Prin. Invest. NASA Tech. Officer CASE Category
Harshvardhan GSFC/Fraser, R. S. 31-Atmos Sci

NAG 8-124 **Purdue University** **3218**
Multiobjective control of space structures
Period *Obligations*
04/10/89-04/09/90 FY89: \$74,404 TOTAL: \$74,404
Prin. Invest. NASA Tech. Officer CASE Category
Skelton, R. E. MSFC/Wailes, H. B. 49-Engr, NEC
MSFC/Nurre, G. S.

NAG 8-764 **Purdue University** **3219**
Synoptic planetary scale interactions and blocking over the North Atlantic ocean
Period *Obligations*
02/21/89-02/20/90 FY89: \$113,520 TOTAL: \$113,520
Prin. Invest. NASA Tech. Officer CASE Category
Smith, P. J. MSFC/Robinson, F. 31-Atmos Sci
MSFC/Kaufman, J. W.

NAG 9-48 **Purdue University** **3220**
Chemical studies of meteorites
Period *Obligations*
03/01/83-03/01/90 FY89: \$68,400 TOTAL: \$360,100
Prin. Invest. NASA Tech. Officer CASE Category
Lipschutz, M. E. JSC/Browne, I. D. 12-Chemistry

NAGW 736 **Purdue University** **3221**
Improving the geological interpretations of magnetic and gravity satellite anomalies
Period *Obligations*
04/01/85-12/31/88 FY89: TOTAL: \$117,504
Prin. Invest. NASA Tech. Officer CASE Category
Hinze, W. J. HQ-EE/Baltuck, M. 32-Geological Sci
HQ-EE/Murphy, R. E.

NAGW 799 **Purdue University** **3222**
Characterization of vegetation by microwave and optical remote sensing
Period *Obligations*
08/01/85-07/31/89 FY89: TOTAL: \$222,161
Prin. Invest. NASA Tech. Officer CASE Category
Daughtry, C. S. HQ-EE/Tuyahov, A. J. 39-Env Sci, NEC

NAGW 925 **Purdue University** **3223**
Earth observation research using multistage EOS like data
Period *Obligations*
08/01/86-09/30/89 FY89: \$372,451 TOTAL: \$911,688
Prin. Invest. NASA Tech. Officer CASE Category
Johannsen, C. J. HQ-EE/Tuyahov, A. J. 39-Env Sci, NEC
Landgrebe, D. A. HQ-EE/Estes, J. E.

NAGW 1056 **Purdue University** **3224**
Telescience testbed program initiation of remote database selection access and networking evaluation
Period *Obligations*
03/01/87-12/31/88 FY89: TOTAL: \$100,000
Prin. Invest. NASA Tech. Officer CASE Category
Collier, R. HQ-E/Schmerling, E. R. 39-Env Sci, NEC
Landgrebe, D. A. HQ-E/Burnett, P.

NAGW 1472 **Purdue University** **3225**
Applying remote sensing and gis techniques in solving rural county information needs
Period *Obligations*
07/01/88-09/30/89 FY89: \$261,769 TOTAL: \$261,769
Prin. Invest. NASA Tech. Officer CASE Category
Johannsen, C. J. HQ-EE/Huntress, W. 39-Env Sci, NEC
Baumgardner, M. F.

NAG10-18 **Purdue University** **3226**
Study of plants growth
Period *Obligations*
02/04/85-11/30/88 FY89: TOTAL: \$198,809
Prin. Invest. NASA Tech. Officer CASE Category
Mitchell, C. A. KSC/Knott, W. M. 55-Agriculture Sci

NAG10-53 **Purdue University** **3227**
Physiological mode of action in mechanical regulation of plant growth
Period *Obligations*
04/24/89-04/23/90 FY89: \$54,979 TOTAL: \$54,979
Prin. Invest. NASA Tech. Officer CASE Category
Mitchell, C. A. KSC/Knott, W. M. 55-Agriculture Sci

NAS 8-34009 **Purdue University** **3228**
Utilization of satellite cloud information to diagnose the energy state and transformations in extratropical cyclones
Period *Obligations*
06/01/81-05/31/89 FY89: TOTAL: \$415,976
Prin. Invest. NASA Tech. Officer CASE Category
Smith, P. J. MSFC/Fichtl, G. H. 31-Atmos Sci
MSFC/Kaufman, J.

NAS 8-37127 **Purdue University** **3229**
South Pacific convergence zone and global scale circulations
Period *Obligations*
07/20/87-07/19/90 FY89: \$94,000 TOTAL: \$282,000
Prin. Invest. NASA Tech. Officer CASE Category
Vincent, D. G. MSFC/Kaufman, J. 31-Atmos Sci
MSFC/Miller, T. L.

NCA 2-223 **Purdue University** **3230**
Applications of fuzzy theories to multi objective system optimization
Period *Obligations*
06/01/87-12/31/89 FY89: TOTAL: \$52,240
Prin. Invest. NASA Tech. Officer CASE Category
Rao, S. S. ARC/Miura, H. 46-Mech Engr
ARC/Kidwell, G., Jr.

NASA'S UNIVERSITY PROGRAM
INDIANA (Continued)

NCC 2-100 **Purdue University** **3231**
 Higher plant species selection criteria for a closed ecological life support system: Photosynthetic and nutritional aspects
Period *Obligations*
 09/01/80-03/31/90 FY89: \$60,518 TOTAL: \$751,083
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Mitchell, C. A. ARC/MacElroy, R. D. 55-Agriculture Sci

NCC 3-128 **Purdue University** **3232**
 A predictive model for failure properties of thermoset resin
Period *Obligations*
 02/01/89-01/31/90 FY89: \$77,893 TOTAL: \$77,893
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Caruthers, J. M. LERC/Roberts, G. D. 47-Materials Engr

NGT 00-050-006 **Purdue University** **3233**
 NASA graduate student researchers program
Period *Obligations*
 08/18/86-08/17/89 FY89: TOTAL: \$54,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Grandt, A. F., Jr. HQ-LE/Owens, F. C. 41-Aero Engr

NGT 00-050-011 **Purdue University** **3234**
 NASA graduate student researchers program
Period *Obligations*
 06/01/86-05/31/89 FY89: TOTAL: \$54,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Incropera, F. P. HQ-LE/Owens, F. C. 46-Mech Engr

NGT 00-050-053 **Purdue University** **3235**
 NASA graduate student researchers program
Period *Obligations*
 06/01/86-08/31/89 FY89: TOTAL: \$54,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Howell, K. C. HQ-LE/Owens, F. C. 41-Aero Engr

NGT 00-050-070 **Purdue University** **3236**
 NASA graduate student researchers program
Period *Obligations*
 06/01/86-05/31/88 FY89: TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Mitchell, O. R. HQ-LE/Owens, F. C. 45-Elec Engr

NGT 00-050-072 **Purdue University** **3237**
 NASA graduate student researchers program
Period *Obligations*
 06/01/86-06/30/89 FY89: TOTAL: \$33,467
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Andrisani, D. HQ-LE/Owens, F. C. 41-Aero Engr

NGT 00-050-154 **Purdue University** **3238**
 NASA graduate student researchers program
Period *Obligations*
 06/01/87-11/31/89 FY89: \$9,000 TOTAL: \$44,334
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Sun, W. Y. HQ-XE/Owens, F. C. 31-Atmos Sci

NGT 00-050-196 **Purdue University** **3239**
 NASA graduate student researchers program
Period *Obligations*
 06/01/87-05/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Kim, K. HQ-XE/Owens, F. C. 51-Biological Sci

NGT 00-050-207 **Purdue University** **3240**
 NASA graduate student researchers program
Period *Obligations*
 06/01/87-05/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Viskanta, R. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 00-050-406 **Purdue University** **3241**
 NASA graduate student researchers program
Period *Obligations*
 07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Yang, H. T. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 00-050-499 **Purdue University** **3242**
 NASA graduate student researchers program
Period *Obligations*
 08/01/89-07/31/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Longuski, J. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 00-070-139 **Purdue University** **3243**
 NASA graduate student researchers underrepresented minority focus program
Period *Obligations*
 07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Grant, E. R. HQ-XE/Owens, F. C. 12-Chemistry

NSG 3135 **Purdue University** **3244**
 Aerodynamics parameters affecting turbopropeller performance
Period *Obligations*
 01/15/77-12/24/89 FY89: \$81,728 TOTAL: \$1,242,003
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Sullivan, J. P. LERC/Miller, C. J. 41-Aero Engr
 A'hearn, M. F.

NSG 3285 **Purdue University** **3245**
 Three-dimensional aerodynamic turbomachines
Period *Obligations*
 07/01/79-01/24/90 FY89: \$65,012 TOTAL: \$883,435
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Fleeter, S. LERC/Schumann, L. 41-Aero Engr

NAG 3-868 **Rose-Hulman Institute of Technology** **3246**
 Time history studies of the response of the classical elastic cantilever beam damped by internal mechanical means
Period *Obligations*
 01/20/88-06/01/89 FY89: TOTAL: \$15,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 North, C. M. LERC/Brown, G. V. 46-Mech Engr
 Nale, T. A.

NAG 3-890 **Saint Marys College** **3247**
 Materials development of high temperature electrical contacts for silicon carbide
Period *Obligations*
 03/20/88-03/19/90 FY89: \$20,000 TOTAL: \$40,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Bellina, J. J. LERC/Matus, L. G. 47-Materials Engr

NASA'S UNIVERSITY PROGRAM
INDIANA (Continued)

NAG 8-620 Tri State University 3248
 To investigate the characteristics of drive and control system schemes for tether crawler systems
Period Obligations
 02/01/87-03/31/88 FY89: TOTAL: \$40,000
Prin. Invest NASA Tech. Officer CASE Category
 Swenson, F. R. MSFC/Harrison, J. K. 19-Phys Sci, NEC

NAG 3-746 University of Evansville 3249
 Kinetic theory model for the flow of a simple gas through and from a two dimensional nozzle
Period Obligations
 10/01/86-01/29/90 FY89: \$20,000 TOTAL: \$64,139
Prin. Invest NASA Tech. Officer CASE Category
 Riley, B. LERC/Tacina, R. R. 42-Astro Engr
 LERC/Braunscheidel, E. P.

NAG 1-727 University of Notre Dame 3250
 Vortex dynamics of highly swept wings undergoing unsteady motions
Period Obligations
 01/01/87-08/31/89 FY89: TOTAL: \$110,960
Prin. Invest NASA Tech. Officer CASE Category
 Nelson, R. C. LARC/Brandon, J. M. 41-Aero Engr
 Batill, S. M. LARC/Nguyen, L. T.

NAG 3-428 University of Notre Dame 3251
 Materials development of electrical contacts for B-Si C
Period Obligations
 05/25/83-09/30/88 FY89: TOTAL: \$240,000
Prin. Invest NASA Tech. Officer CASE Category
 Zeller, M. V. LERC/Matus, L. G. 47-Materials Engr
 Kwor, R.
 Stanchina, W. E.

NAG 3-732 University of Notre Dame 3252
 Effects of nonuniform flows on the aerodynamics and noise radiation of advanced turboprops
Period Obligations
 06/15/86-02/13/90 FY89: \$55,936 TOTAL: \$180,237
Prin. Invest NASA Tech. Officer CASE Category
 Atassi, H. M. LERC/Groeneweg, J. F. 41-Aero Engr

NAG 5-557 University of Notre Dame 3253
 Error control techniques for satellite and space communications
Period Obligations
 06/01/85-07/31/90 FY89: \$68,991 TOTAL: \$287,820
Prin. Invest NASA Tech. Officer CASE Category
 Costello, D. GSFC/Miller, W. H. 49-Engr, NEC
 GSFC/Morakis, J. C.

NCA 2-162 University of Notre Dame 3254
 Leading edge vortex control by direct core blowing
Period Obligations
 10/01/86-12/31/88 FY89: \$16,000 TOTAL: \$80,000
Prin. Invest NASA Tech. Officer CASE Category
 Nelson, R. C. ARC/Schreiner, J. A. 41-Aero Engr
 Ng, T. T.

NCA 2-406 University of Notre Dame 3255
 The fluid mechanic mechanisms causing limit cycle roll oscillations
Period Obligations
 06/15/89-06/14/91 FY89: \$35,000 TOTAL: \$35,000
Prin. Invest NASA Tech. Officer CASE Category
 Nelson, R. C. ARC/Schiff, L. B. 41-Aero Engr

NGT 00-070-019 University of Notre Dame 3256
 Graduate student researchers underrepresented minority focus program
Period Obligations
 06/01/87-05/31/89 FY89: TOTAL: \$34,800
Prin. Invest NASA Tech. Officer CASE Category
 Nelson, R. C. HQ-LE/Owens, F. C. 41-Aero Engr
 Batill, S. M.

NGT 00-070-109 University of Notre Dame 3257
 NASA graduate student researchers underrepresented minority focus program
Period Obligations
 01/01/89-12/31/89 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest NASA Tech. Officer CASE Category
 Costello, D. J. HQ-XE/Owens, F. C. 45-Elec Engr

NSG 1419 University of Notre Dame 3258
 Structure of separated flow regions occurring near the leading edge of air foils including transition
Period Obligations
 06/01/77-12/31/89 FY89: TOTAL: \$457,917
Prin. Invest NASA Tech. Officer CASE Category
 Mueller, T. J. LARC/McGhee, R. J. 41-Aero Engr
 LARC/Harvey, W. D.

NAG 5-964 Valpariso University 3259
 Ultraviolet observations of the unique contact benoig UZ piscium
Period Obligations
 09/01/87-08/31/90 FY89: TOTAL: \$18,500
Prin. Invest NASA Tech. Officer CASE Category
 Hrivnak, B. J. GSFC/Kondo, Y. 11-Astronomy
 Guinan, E. F.
 Vilhu, O.

IOWA

NAS 8-33728 Drake University 3260
 Assess use and development of a computer code rotating flows
Period Obligations
 03/17/80-08/31/89 FY89: TOTAL: \$118,772
Prin. Invest NASA Tech. Officer CASE Category
 Kopicky, K. J. MSFC/Fowles, W. W. 19-Phys Sci, NEC
 MSFC/Miller, T. L.

NAG 1-645 Iowa State University 3261
 Numerical computation of viscous flow about unconventional airfoil shapes
Period Obligations
 03/01/86-03/31/90 FY89: TOTAL: \$145,401
Prin. Invest NASA Tech. Officer CASE Category
 Tannehill, J. C. LARC/Sewall, W. G. 29-Math/Computer, NEC
 Rajagopalan, R. G. LARC/Maestrello, L.

NAG 1-984 Iowa State University 3262
 A theoretical study of fluctuating pressure loads due to self excited oscillating shock boundary layer interaction
Period Obligations
 04/01/89-03/31/90 FY89: \$51,240 TOTAL: \$51,240
Prin. Invest NASA Tech. Officer CASE Category
 Inger, G. R. LARC/Zorunski, W. E. 41-Aero Engr

NASA'S UNIVERSITY PROGRAM

IOWA (Continued)

NAG 2-30 Iowa State University 3263
 Low-speed, high-lift aerodynamics
Period Obligations
 03/01/80-08/31/89 FY89: TOTAL: \$49,000
Prin. Invest. NASA Tech. Officer CASE Category
 James, W. D. ARC/Olson, L. E. 41-Aero Engr
 ARC/Corsiglia, V. R.

NAG 5-707 Iowa State University 3271
 Observations of the brightest normal m-type mira variables
Period Obligations
 09/01/85-05/31/90 FY89: \$52,698 TOTAL: \$129,247
Prin. Invest. NASA Tech. Officer CASE Category
 Willson, L. A. GSFC/Kondo, Y. 11-Astronomy
 Brugel, E.
 Evans, N.

NAG 2-151 Iowa State University 3264
 Modeling of windblown dust on Mars and Venus
Period Obligations
 01/01/82-06/30/90 FY89: \$16,455 TOTAL: \$129,083
Prin. Invest. NASA Tech. Officer CASE Category
 Iverson, J. D. ARC/Smith, B. F. 19-Phys Sci, NEC
 ARC/Pollack, J. B.

NAG 5-1060 Iowa State University 3272
 Analysis of satellite derived ozone and water vapor measurements
Period Obligations
 07/15/88-11/30/89 FY89: \$28,000 TOTAL: \$42,000
Prin. Invest. NASA Tech. Officer CASE Category
 Stanford, J. L. GSFC/Wu, M. L. 31-Atmos Sci

NAG 2-502 Iowa State University 3265
 Numerical computation of the chemically reacting flow around the national aerospace plane
Period Obligations
 03/01/88-01/31/90 FY89: \$35,040 TOTAL: \$88,625
Prin. Invest. NASA Tech. Officer CASE Category
 Tannehill, J. C. ARC/Green, M. J. 42-Astro Engr

NAG 5-1181 Iowa State University 3273
 Radiative transfer in the dynamic atmospheres of mira-type variables
Period Obligations
 08/15/89-08/14/90 FY89: \$12,775 TOTAL: \$12,775
Prin. Invest. NASA Tech. Officer CASE Category
 Bowen, G. GSFC/West, D. 11-Astronomy

NAG 3-356 Iowa State University 3266
 Investigation of unsteady axial-flow compressor stator flow
Period Obligations
 11/30/82-09/30/88 FY89: TOTAL: \$35,230
Prin. Invest. NASA Tech. Officer CASE Category
 Okiishi, T. H. LERC/Strazisar, A. J. 41-Aero Engr
 Hathaway, M. D.

NAG 5-1186 Iowa State University 3274
 The search for extended infrared emission near interacting and active galaxies
Period Obligations
 08/01/89-07/31/90 FY89: \$30,000 TOTAL: \$30,000
Prin. Invest. NASA Tech. Officer CASE Category
 Appleton, P. N. GSFC/West, D. 11-Astronomy

NAG 3-917 Iowa State University 3267
 Detection of transition and separated flow regions on turbomachine blades with liquid crystal blading
Period Obligations
 08/21/88-08/20/90 FY89: \$64,883 TOTAL: \$105,300
Prin. Invest. NASA Tech. Officer CASE Category
 Okiishi, T. H. LERC/Hathaway, M. D. 41-Aero Engr

NAG 5-1187 Iowa State University 3275
 A study of main sequence star infrared colors using infrared astronomy satellite archival data
Period Obligations
 08/01/89-07/31/90 FY89: \$21,149 TOTAL: \$21,149
Prin. Invest. NASA Tech. Officer CASE Category
 Willson, L. A. GSFC/West, D. 11-Astronomy

NAG 3-957 Iowa State University 3268
 Simulation of a combined cycle engine
Period Obligations
 12/01/88-11/30/89 FY89: \$19,645 TOTAL: \$19,645
Prin. Invest. NASA Tech. Officer CASE Category
 Van Gerpen, J. H. LERC/Bill, R. C. 46-Mech Engr
 LERC/Bobula, G.

NAG 9-112 Iowa State University 3276
 Partially differentiated meteorite parent bodies
Period Obligations
 05/01/85-05/01/89 FY89: TOTAL: \$54,970
Prin. Invest. NASA Tech. Officer CASE Category
 Kracher, A. JSC/Browne, I. D. 47-Materials Engr

NAG 3-1075 Iowa State University 3269
 Analysis of supersonic throughflow fan phenomena
Period Obligations
 10/01/89-09/30/91 FY89: \$54,317 TOTAL: \$54,317
Prin. Invest. NASA Tech. Officer CASE Category
 Okiishi, T. H. LERC/Reid, L. 41-Aero Engr

NAGW 1009 Iowa State University 3277
 The theoretical models of gas dynamics star formation in interacting ring galaxies
Period Obligations
 01/01/87-12/31/89 FY89: \$40,000 TOTAL: \$119,173
Prin. Invest. NASA Tech. Officer CASE Category
 Struck Marcell H. C. HQ-EZ/Gillett, F. C. 11-Astronomy
 HQ-EZ/Boggess, N. W.

NAG 5-355 Iowa State University 3270
 Diagnostic-analysis of diabatic heating and maintenance of thermal fields in the Southern Hemisphere
Period Obligations
 08/01/83-06/30/90 FY89: \$63,000 TOTAL: \$261,045
Prin. Invest. NASA Tech. Officer CASE Category
 Chen, T. C. GSFC/Plaendner, J. W. 31-Atmos Sci

NAGW 1364 Iowa State University 3278
 Mechanisms and implications of mass loss associated with stellar pulsation
Period Obligations
 03/01/88-02/28/90 FY89: \$112,559 TOTAL: \$216,300
Prin. Invest. NASA Tech. Officer CASE Category
 Willson, L. A. HQ-EZ/Clayton, G. C. 13-Physic
 HQ-ES/Jones, W. V.

NASA'S UNIVERSITY PROGRAM **IOWA (Continued)**

NAS10-11540 Iowa State University 3279
High speed flexible robotic controller HSFR for NASA KSC's robotic applications development laboratory

Period	Obligations	
01/24/89-02/23/90	FY89: \$179,579	TOTAL: \$179,579
Prin. Invest.	NASA Tech. Officer	CASE Category
Fullmer, R.	KSC/Le, C.	22-Computer Science
	KSC/Davis, V. L.	

NCA 2-174 Iowa State University 3280
The vorticity potential method for three dimensional unsteady compressible viscous flows

Period	Obligations	
11/01/86-08/31/89	FY89:	TOTAL: \$31,371
Prin. Invest.	NASA Tech. Officer	CASE Category
Pletcher, R. H.	ARC/Van Dalsem, W. R.	46-Mech Engr
	ARC/Steger, J. L.	

NCA 2-190 Iowa State University 3281
Development of a surface geometry description algorithm and corresponding computer code for surface grid generation

Period	Obligations	
01/01/87-08/31/89	FY89:	TOTAL: \$57,659
Prin. Invest.	NASA Tech. Officer	CASE Category
Vogel, J. M.	ARC/Holst, T. L.	41-Aero Engr

NCA 2-346 Iowa State University 3282
Development of a perturbed flow field code

Period	Obligations	
09/01/88-12/31/89	FY89:	TOTAL: \$29,890
Prin. Invest.	NASA Tech. Officer	CASE Category
Wilson, L. N.	ARC/Holst, T. L.	41-Aero Engr
	ARC/Lawrence, S. L.	

NCA 2-443 Iowa State University 3283
Aerodynamic analysis of berp tip

Period	Obligations	
08/16/89-10/15/89	FY89: \$4,000	TOTAL: \$4,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Rajagopalan, R. G.	ARC/Tung, C.	41-Aero Engr

NCC 2-174 Iowa State University 3284
Theoretical models for the primordial atmospheres of terrestrial planets and for the interiors of Uranus and Neptune

Period	Obligations	
02/01/82-02/28/89	FY89:	TOTAL: \$148,213
Prin. Invest.	NASA Tech. Officer	CASE Category
Richardson, S. M.	ARC/Pollack, J. B.	19-Phys Sci, NEC
Podolzk, M.	ARC/Reynolds, R. T.	

NCC 2-476 Iowa State University 3285
Numerical modeling of propulsive effects in complex flow fields

Period	Obligations	
06/01/87-12/31/89	FY89:	TOTAL: \$204,620
Prin. Invest.	NASA Tech. Officer	CASE Category
Pletcher, R. H.	ARC/Steger, J. L.	41-Aero Engr

NGT 00-050-128 Iowa State University 3286
NASA graduate student researchers program

Period	Obligations	
06/01/87-05/31/89	FY89:	TOTAL: \$36,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Pierson, B. L.	HQ-XE/Owens, F. C.	41-Aero Engr

NGT 00-050-137 Iowa State University 3287
NASA graduate student researchers program

Period	Obligations	
06/01/87-05/31/90	FY89: \$18,000	TOTAL: \$54,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Okiishi, T. H.	HQ-XE/Owens, F. C.	46-Mech Engr

NGT 00-050-269 Iowa State University 3288
NASA graduate student researchers program

Period	Obligations	
08/15/88-08/14/90	FY89: \$18,000	TOTAL: \$36,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Oldehoeft, A. E.	HQ-XE/Owens, F. C.	22-Computer Science

NGT 00-050-407 Iowa State University 3289
NASA graduate student researchers program

Period	Obligations	
07/01/89-05/31/90	FY89: \$18,000	TOTAL: \$18,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Pierson, B. L.	HQ-XE/Owens, F. C.	49-Engr, NEC

NGT 00-050-441 Iowa State University 3290
NASA graduate student researchers program

Period	Obligations	
07/01/89-06/30/90	FY89: \$18,000	TOTAL: \$18,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Hindman, R. G.	HQ-XE/Owens, F. C.	41-Aero Engr

NGT 16-002-802 Iowa State University 3291
NASA graduate student researchers program

Period	Obligations	
06/01/84-05/31/90	FY89:	TOTAL: \$84,100
Prin. Invest.	NASA Tech. Officer	CASE Category
Pletcher, R. H.	HQ-LB/Owens, F. C.	46-Mech Engr

NAG 2-571 University of Iowa 3292
Continuing analysis and interpretation of data from Pioneer 10 and 11

Period	Obligations	
08/01/89-07/31/90	FY89: \$102,150	TOTAL: \$102,150
Prin. Invest.	NASA Tech. Officer	CASE Category
Van Allen, J. A.	ARC/Lasher, L. E.	11-Astronomy
	ARC/Fimmel, R. O.	

NAG 3-449 University of Iowa 3293
Interpretation of STS-3/plasma diagnostics package results in terms of large space structure plasma interactions

Period	Obligations	
07/10/83-08/01/90	FY89: \$75,043	TOTAL: \$540,654
Prin. Invest.	NASA Tech. Officer	CASE Category
Kurth, W. S.	LERC/Purvis, C. K.	19-Phys Sci, NEC
Gurnett, D. A.	LERC/Ferguson, D. C.	
Pickett, J. S.		

NAG 3-893 University of Iowa 3294
Supported transition metal and metal oxide catalysts for paratogrtho hydrogen conversion

Period	Obligations	
03/30/88-09/30/89	FY89: \$91,414	TOTAL: \$161,294
Prin. Invest.	NASA Tech. Officer	CASE Category
Eyman, D. P.	LERC/Williamson, G. S.	12-Chemistry
	LERC/Hemminger, J. A.	

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NAG 3-1056		University of Iowa	3295
Theoretical study of a catalyst for para to ortho hydrogen conversion			
<i>Period</i>	<i>Obligations</i>		
06/12/89-06/11/90	FY89: \$65,734	TOTAL: \$65,734	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Coffman, R. E.	LERC/Williamson, G. S.	12-Chemistry	
	LERC/Hemminger, J. A.		
NAG 5-295		University of Iowa	3296
Measurement of low-energy electrons and protons in the Earth's magnetosphere			
<i>Period</i>	<i>Obligations</i>		
02/01/83-01/31/90	FY89: \$94,000	TOTAL: \$377,003	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Frank, L. A.	GSFC/Wales, R. O.	11-Astronomy	
NAG 5-310		University of Iowa	3297
Dynamics Explorer plasma wave instrument			
<i>Period</i>	<i>Obligations</i>		
04/15/83-11/30/89	FY89: \$241,245	TOTAL: \$1,860,864	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Gurnett, D. A.	GSFC/Bullock, G. D.	19-Phys Sci, NEC	
	GSFC/Hoffman, R. A.		
NAG 5-483		University of Iowa	3298
Global auroral imaging			
<i>Period</i>	<i>Obligations</i>		
11/01/84-12/31/89	FY89: \$400,000	TOTAL: \$2,565,315	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Frank, L. A.	GSFC/Bullock, G. D.	19-Phys Sci, NEC	
	GSFC/Hoffman, R. A.		
NAG 5-1093		University of Iowa	3299
Measurements of plasma wave and wave particle interactions in the Earth's magnetosphere, the solar wind and near comets			
<i>Period</i>	<i>Obligations</i>		
11/01/88-10/31/89	FY89: \$353,000	TOTAL: \$353,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Gurnett, D. A.	GSFC/Wales, R. O.	39-Env Sci, NEC	
Anderson, R. R.			
NAG 5-1109		University of Iowa	3300
Data analysis for the ISEE 1 and 2 magnetospheric and interplanetary plasma instruments			
<i>Period</i>	<i>Obligations</i>		
11/01/88-10/31/89	FY89: \$325,000	TOTAL: \$325,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Frank, L. A.	GSFC/Wales, R. O.	19-Phys Sci, NEC	
NAG 5-1120		University of Iowa	3301
Plasma waves in the Earth's magnetosphere and geomagnetic tail using AMPTE data			
<i>Period</i>	<i>Obligations</i>		
02/01/89-01/31/90	FY89: \$40,000	TOTAL: \$40,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Anderson, R.	GSFC/Curtis, S. A.	13-Physics	
	GSFC/Acuna, M. A.		
NAG 5-1126		University of Iowa	3302
Optimal combining of ground based sensors for validating satellite based rainfall estimates			
<i>Period</i>	<i>Obligations</i>		
03/15/89-12/14/89	FY89: \$25,000	TOTAL: \$25,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Krajewski, W. F.	GSFC/Bell, T.	31-Atmos Sci	
NAG 5-1174		University of Iowa	3303
The structure of circumstellar shells			
<i>Period</i>	<i>Obligations</i>		
08/01/89-07/31/90	FY89: \$23,666	TOTAL: \$23,666	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Fix, J. D.	GSFC/West, D.	11-Astronomy	
NAG 5-1175		University of Iowa	3304
An X ray spectrum of a selected binary source			
<i>Period</i>	<i>Obligations</i>		
08/01/89-07/31/90	FY89: \$19,200	TOTAL: \$19,200	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Molnar, L. A.	GSFC/West, D.	11-Astronomy	
NAG 8-635		University of Iowa	3305
Use of satellite data and modelling to assess the influence of stratospheric processes on the troposphere			
<i>Period</i>	<i>Obligations</i>		
08/01/87-12/31/89	FY89:	TOTAL: \$98,374	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Nathan, T. R.	MSFC/Miller, T. L.	31-Atmos Sci	
Yarger, D. N.	MSFC/Kaufman, J. W.		
NAGW 796		University of Iowa	3306
Photometry of comet Halley			
<i>Period</i>	<i>Obligations</i>		
08/01/85-12/31/89	FY89:	TOTAL: \$98,204	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Neff, J. S.	HQ-EL/Brinton, H. C.	11-Astronomy	
	HQ-EL/Rahe, J. H.		
NAGW 806		University of Iowa	3307
Shock associated alfvén waves in the solar wind			
<i>Period</i>	<i>Obligations</i>		
10/01/85-12/31/88	FY89:	TOTAL: \$180,200	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Spangler, S. R.	HQ-ES/Desch, M. D.	13-Physics	
	HQ-EE/Eastman, T. E.		
NAGW 827		University of Iowa	3308
Investigations of wave emissions from planetary magnetospheres			
<i>Period</i>	<i>Obligations</i>		
10/01/85-05/31/89	FY89:	TOTAL: \$119,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Grabbe, C. L.	HQ-ES/Desch, M. D.	13-Physics	
	HQ-EE/Parks, G. K.		
NAGW 831		University of Iowa	3309
A comparison of plasma processes in the solar wind and the interstellar medium			
<i>Period</i>	<i>Obligations</i>		
12/01/85-12/31/89	FY89:	TOTAL: \$292,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Spangler, S. R.	HQ-E/Rosendhal, J. D.	19-Phys Sci, NEC	
	HQ-EP/Konkel, R. M.		
NAGW 871		University of Iowa	3310
A multi-disciplinary study of cosmic dust			
<i>Period</i>	<i>Obligations</i>		
01/01/86-06/30/89	FY89:	TOTAL: \$300,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Fix, J. D.	HQ-E/Alexander, J. K.	19-Phys Sci, NEC	
	HQ-EP/Konkel, R. M.		

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NAGW 970	University of Iowa	3311	The physics of magnetospheric boundary layers <i>Period</i> 08/25/86-11/30/89 <i>Prin. Invest.</i> Goertz, C. K.	<i>Obligations</i> FY89: \$277,000 NASA Tech. Officer HQ-ES/Mellott, M. M. GSFC/Curtis, S. A.	<i>CASE Category</i> TOTAL: \$857,000 13-Physics
NAGW 1564	University of Iowa	3319	The magnetospheric boundary regions and their auroral signatures <i>Period</i> 03/01/89-02/28/90 <i>Prin. Invest.</i> Huang, C. Y.	<i>Obligations</i> FY89: \$40,000 NASA Tech. Officer HQ-ES/Parks, G. K. HQ-ES/Perry, T. W.	<i>CASE Category</i> TOTAL: \$40,000 13-Physics
NAGW 1156	University of Iowa	3312	Laboratory investigations of electrostatic ion cyclotron waves plasma flow body interactions and magnetized double layers <i>Period</i> 08/15/87-07/31/89 <i>Prin. Invest.</i> D'angelo, N. Merlino, R. L.	<i>Obligations</i> FY89: \$103,000 NASA Tech. Officer HQ-ES/Desch, M. D. HQ-ES/Perry, T. W.	<i>CASE Category</i> TOTAL: \$103,000 13-Physics
NAGW 1594	University of Iowa	3320	Shock associated magnetohydrodynamic waves in the solar wind <i>Period</i> 01/01/89-12/21/89 <i>Prin. Invest.</i> Spangler, S. R.	<i>Obligations</i> FY89: \$60,000 NASA Tech. Officer HQ-ES/Mellott, M. M. HQ-ES/Jones, W. V.	<i>CASE Category</i> TOTAL: \$60,000 13-Physics
NAGW 1188	University of Iowa	3313	Biometric band albedo and global radiative energy balance of Uranus <i>Period</i> 09/15/87-09/14/89 <i>Prin. Invest.</i> Neff, J. S.	<i>Obligations</i> FY89: \$4,406 NASA Tech. Officer HQ-EL/Quaide, W. L. HQ-EL/Fox, K.	<i>CASE Category</i> TOTAL: \$8,480 19-Phys Sci, NEC
NAGW 1631	University of Iowa	3321	Special topics in auroral and ionospheric physics <i>Period</i> 02/01/89-01/31/90 <i>Prin. Invest.</i> Frank, L. A.	<i>Obligations</i> FY89: \$30,000 NASA Tech. Officer HQ-ES/Parks, G. K. HQ-ES/Perry, T. W.	<i>CASE Category</i> TOTAL: \$30,000 13-Physics
NAGW 1206	University of Iowa	3314	Analysis of uranian radio emissions <i>Period</i> 08/15/87-09/30/90 <i>Prin. Invest.</i> Calvert, W.	<i>Obligations</i> FY89: \$184,475 NASA Tech. Officer HQ-EL/Quaide, W. L. HQ-EL/Slavin, J. A.	<i>CASE Category</i> TOTAL: \$270,085 19-Phys Sci, NEC
NAGW 1632	University of Iowa	3322	Microscopic theory of nonlinear space plasma phenomena <i>Period</i> 11/01/88-10/31/89 <i>Prin. Invest.</i> Goertz, C. K.	<i>Obligations</i> FY89: \$30,000 NASA Tech. Officer HQ-ES/Mellott, M. M. HQ-ES/Perry, T. W.	<i>CASE Category</i> TOTAL: \$30,000 13-Physics
NAGW 1239	University of Iowa	3315	Particle simulations in magnetospheric plasmas <i>Period</i> 11/01/87-10/31/89 <i>Prin. Invest.</i> Nishikawa, K. I.	<i>Obligations</i> FY89: \$23,000 NASA Tech. Officer HQ-ES/Desch, M. D. HQ-ES/Perry, T. W.	<i>CASE Category</i> TOTAL: \$68,000 13-Physics
NAGW 1653	University of Iowa	3323	Observational test of the thermal catastrophe model <i>Period</i> 02/01/89-01/31/90 <i>Prin. Invest.</i> Smith, R. A.	<i>Obligations</i> FY89: \$56,000 NASA Tech. Officer HQ-ES/Mellott, M. M. HQ-ES/Perry, T. W.	<i>CASE Category</i> TOTAL: \$56,000 13-Physics
NAGW 1488	University of Iowa	3316	Research on waves in plasmas <i>Period</i> 12/01/88-11/30/89 <i>Prin. Invest.</i> Gurnett, D. A.	<i>Obligations</i> FY89: \$125,000 NASA Tech. Officer HQ-ES/Parks, G. K. HQ-ES/Perry, T. W.	<i>CASE Category</i> TOTAL: \$125,000 13-Physics
NAGW 1668	University of Iowa	3324	Dusty plasmas in space <i>Period</i> 03/01/89-02/28/90 <i>Prin. Invest.</i> Goertz, C.	<i>Obligations</i> FY89: \$45,000 NASA Tech. Officer HQ-ES/Parks, G. K. HQ-ES/Perry, T. W.	<i>CASE Category</i> TOTAL: \$45,000 13-Physics
NAGW 1536	University of Iowa	3317	The thefa aurora and the dependence of its motion on the orientation of the interplanetary magnetic fields <i>Period</i> 01/01/89-12/31/89 <i>Prin. Invest.</i> Craven, J. D.	<i>Obligations</i> FY89: \$25,500 NASA Tech. Officer HQ-ES/Parks, G. K. HQ-ES/Perry, T. W.	<i>CASE Category</i> TOTAL: \$25,500 13-Physics
NAGW 1730	University of Iowa	3325	The visible and ultraviolet zodiacal light <i>Period</i> 05/01/89-04/30/90 <i>Prin. Invest.</i> Fix, J. D.	<i>Obligations</i> FY89: \$24,959 NASA Tech. Officer HQ-EZ/Clayton, G.	<i>CASE Category</i> TOTAL: \$24,959 11-Astronomy
NAGW 1539	University of Iowa	3318	Plasma waves associated with the Spacelab 2 electron beam injections <i>Period</i> 01/01/89-12/31/89 <i>Prin. Invest.</i> Kurth, W. S.	<i>Obligations</i> FY89: \$29,596 NASA Tech. Officer HQ-ES/Parks, G. K. HQ-ES/Perry, T. W.	<i>CASE Category</i> TOTAL: \$29,596 13-Physics
NAGW 1739	University of Iowa	3326	Earth's magnetosphere at high latitudes and large radial distances <i>Period</i> 05/01/89-04/30/90 <i>Prin. Invest.</i> Van Allen, J. A.	<i>Obligations</i> FY89: \$60,000 NASA Tech. Officer HQ-ES/Parks, G. K. HQ-ES/Perry, T. W.	<i>CASE Category</i> TOTAL: \$60,000 31-Atmos Sci

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NAGW 1791 University of Iowa 3327
 Laboratory studies of plasma double layers in non-uniform magnetic fields
Period *Obligations*
 08/01/89-07/31/90 FY89: \$55,000 TOTAL: \$55,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 D'angelo, M. HQ-ES/Mellott, M. M. 13-Physics
 HQ-ES/Perry, T. W.

NAS 2-12327 University of Iowa 3328
 Analysis and interpretation of data from geiger tube telescope on Pioneer 10 and 11
Period *Obligations*
 11/01/85-08/31/89 FY89: TOTAL: \$347,437
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Van Allen, J. A. ARC/Craig, R. A. 11-Astronomy
 ARC/Fimmel, R. O.

NAS 5-26843 University of Iowa 3329
 A plasma wave investigation for the origin of plasmas in the Earth's neighborhood polar plasma laboratory
Period *Obligations*
 06/07/82-09/30/89 FY89: TOTAL: \$836,405
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Gurnett, D. A. GSFC/Wainscott, F. 13-Physics

NAS 5-26857 University of Iowa 3330
 A plasma wave investigation for the origin of plasmas in the Earth's neighborhood geomagnetic tail laboratory
Period *Obligations*
 06/07/82-07/31/92 FY89: \$300,000 TOTAL: \$1,644,370
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Gurnett, D. A. GSFC/Wainscott, F. 13-Physics

NAS 5-26858 University of Iowa 3331
 Conduct a definition study of the comprehensive plasmas instrument for measurement of plasma in the Earth's magnetotail under the OPEN project
Period *Obligations*
 05/24/82-07/31/92 FY89: \$3,090,241 TOTAL: \$5,988,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Frank, L. A. GSFC/Wainscott, F. 11-Astronomy

NAS 5-27358 University of Iowa 3332
 Definition of advanced auroral imaging instrumentation at visible wavelengths (open mission)
Period *Obligations*
 12/10/82-12/31/89 FY89: TOTAL: \$746,469
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Frank, L. A. GSFC/O'Brien, J. J. 13-Physics

NAS 5-28700 University of Iowa 3333
 Provide data reduction and analysis for the International Sun Earth Explorer (ISEE 1 and 2) spacecraft
Period *Obligations*
 01/24/85-11/24/88 FY89: TOTAL: \$1,156,400
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Frank, L. GSFC/Wales, R. O. 31-Atmos Sci

NAS 5-28701 University of Iowa 3334
 Data reduction and analysis for the ISEE spacecraft's plasma wave experiment
Period *Obligations*
 01/02/85-11/02/88 FY89: TOTAL: \$1,207,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Gurnett, D. A. GSFC/Wales, R. O. 31-Atmos Sci

NAS 5-30316 University of Iowa 3335
 Mission ops and data analysis for visible imaging investigation for the polar mission
Period *Obligations*
 02/06/89-06/30/95 FY89: \$3,875,079 TOTAL: \$3,875,079
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Frank, L. GSFC/Wainscott, F. H. 13-Physics

NAS 5-30365 University of Iowa 3336
 Instrument definition of the wide band radio wave and radio interferometry WBD investigation ISTP cluster
Period *Obligations*
 10/01/88-09/30/89 FY89: TOTAL: \$94,484
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Gurnett, D. A. GSFC/Stich, K. 13-Physics

NAS 5-30371 University of Iowa 3337
 Plasma wave investigation phase C D for the ISTP polar mission
Period *Obligations*
 01/01/89-01/31/94 FY89: \$2,220,360 TOTAL: \$2,220,360
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Gurnett, D. A. GSFC/Wainscott, F. 13-Physics

NAS 8-33770 University of Iowa 3338
 Research study, a recoverable plasma diagnostics package for spacelab
Period *Obligations*
 07/25/80-09/30/92 FY89: TOTAL: \$6,720,610
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Frank, L. A. MSFC/Soutullo, B. C. 13-Physics
 MSFC/Ise, R.

NCC 1-97 University of Iowa 3339
 Application of the STEM-II comprehensive eulerian combined transport/transformation/removal model of data from the FY-84 Philadelphia field study
Period *Obligations*
 04/23/85-12/31/88 FY89: TOTAL: \$179,840
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Carmichael, G. R. LARC/Ritter, J. A. 31-Atmos Sci
 LARC/Fishman, J.

NGL 16-001-002 University of Iowa 3340
 Theoretical and experimental studies related to particles and fields associated with major bodies of solar system and with interplanetary space
Period *Obligations*
 05/23/82-04/30/89 FY89: TOTAL: \$6,810,527
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Van Allen, J. A. HQ-ES/Desch, M. D. 13-Physics
 HQ-ES/Parks, G. K.

NGL 16-001-043 University of Iowa 3341
 Waves in plasmas
Period *Obligations*
 03/28/87-11/30/88 FY89: TOTAL: \$2,626,173
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Gurnett, D. A. HQ-ES/Desch, M. D. 13-Physics
 HQ-ES/Parks, G. K.

NGT 00-050-204 University of Iowa 3342
 NASA graduate student researchers program
Period *Obligations*
 09/01/87-08/31/88 FY89: TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 D'angelo, N. HQ-XE/Owens, F. C. 13-Physics

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NGT 00-050-250 University of Iowa 3343
NASA graduate student researchers program
Period Obligations
09/01/87-08/31/89 FY89: TOTAL: \$34,800
Prin. Invest. NASA Tech. Officer CASE Category
Robinson, J. HQ-XE/Owens, F. C. 45-Elec Engr

NGT 00-050-362 University of Iowa 3344
NASA graduate student researchers program
Period Obligations
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Arora, J. HQ-XE/Owens, F. C. 49-Engr, NEC

NSG 7632 University of Iowa 3345
Investigation of charged particle acceleration mechanisms in space plasmas
Period Obligations
07/01/79-10/30/88 FY89: TOTAL: \$470,000
Prin. Invest. NASA Tech. Officer CASE Category
Goertz, C. K. HQ-ES/Desch, M. D. 19-Phys Sci, NEC
Nicholson, D. R. HQ-ES/Parks, G. K.

KANSAS

NAG 1-777 Kansas State University 3346
A high angle of attack controller for the X-29
Period Obligations
05/20/87-11/30/87 FY89: TOTAL: \$8,989
Prin. Invest. NASA Tech. Officer CASE Category
Downing, D. R. LARC/Nguyen, L. T. 41-Aero Engr
LARC/Croom, M. A.

NAG 5-389 Kansas State University 3347
Measurements of micrometeorological parameters of testing large-scale models
Period Obligations
02/01/84-11/14/90 FY89: \$239,016 TOTAL: \$1,622,017
Prin. Invest. NASA Tech. Officer CASE Category
Kirkham, M. B. GSFC/Hall, F. G. 31-Atmos Sci
Demetriades-sha, T.

NAG 5-897 Kansas State University 3348
The influence of grazing on land surface climatological variables
Period Obligations
05/01/87-01/31/90 FY89: \$42,000 TOTAL: \$132,000
Prin. Invest. NASA Tech. Officer CASE Category
Seastedt, T. R. GSFC/Levine, E. R. 39-Env Sci, NEC
Dyer, M. I. GSFC/Hall, F.

NAGW 1111 Kansas State University 3349
Photogeologic study of selected features on Mars claritas fossae
Period Obligations
04/01/87-12/31/89 FY89: \$105,404 TOTAL: \$327,319
Prin. Invest. NASA Tech. Officer CASE Category
Underwood, J. R. HQ-EL/Scott, D. H. 32-Geological Sci
HQ-EL/Boyce, J. M.

NGT 17-002-801 Kansas State University 3350
NASA graduate student researches program
Period Obligations
06/01/85-05/31/89 FY89: TOTAL: \$53,000
Prin. Invest. NASA Tech. Officer CASE Category
Asrar, G. HQ-LE/Owens, F. C. 21-Mathematics

NAG 1-345 University of Kansas 3351
Aerodynamics and flight dynamics of subsonic aircraft
Period Obligations
03/03/83-12/31/89 FY89: TOTAL: \$973,691
Prin. Invest. NASA Tech. Officer CASE Category
Roskan, J. LARC/Williams, L. J. 41-Aero Engr
Downing, D. R. LARC/Dunham, D. J.
Smith, H. W.

NAG 1-761 University of Kansas 3352
A project to transfer technology from NASA centers in support of industrial innovation in the midwest
Period Obligations
04/01/87-12/31/89 FY89: TOTAL: \$78,550
Prin. Invest. NASA Tech. Officer CASE Category
Barr, B. G. LARC/Samos, J. 49-Engr, NEC
LARC/Rose, L. J.

NAG 1-837 University of Kansas 3353
Aerodynamics of thrust vectoring
Period Obligations
12/10/87-12/09/89 FY89: \$40,254 TOTAL: \$73,885
Prin. Invest. NASA Tech. Officer CASE Category
Lan, C. E. LARC/Krist, S. 41-Aero Engr
LARC/Henderson, W. P.

NAG 1-867 University of Kansas 3354
Analysis of flight data obtained on a pusher propeller on a turboprop testbed aircraft
Period Obligations
03/16/88-03/15/90 FY89: \$40,958 TOTAL: \$65,926
Prin. Invest. NASA Tech. Officer CASE Category
Farokhi, S. LARC/Farassat, F. 41-Aero Engr
LARC/Preisser, J. S.

NAG 1-912 University of Kansas 3355
A program of augmented telerobotic research
Period Obligations
09/15/88-12/31/89 FY89: \$150,000 TOTAL: \$200,000
Prin. Invest. NASA Tech. Officer CASE Category
Barr, B. G. LARC/Mixon, R. W. 46-Mech Engr
LARC/Hankins, W. W.

NAG 2-600 University of Kansas 3356
Spaceflight effects on muscle injury repair: Changes in muscle serine proteases, serpins and matrix molecules
Period Obligations
06/01/89-10/31/89 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
Festoff, B. W. ARC/Grindeland, R. E. 56-Medical Sciences

NAG 3-841 University of Kansas 3357
Effect of streamline curvature and swirl on turbulence modelling in curved ducts
Period Obligations
01/01/88-12/31/90 FY89: \$35,000 TOTAL: \$67,270
Prin. Invest. NASA Tech. Officer CASE Category
Farokhi, S. LERC/Towne, C. E. 41-Aero Engr
Cheng, G. LERC/Anderson, B. H.

NASA'S UNIVERSITY PROGRAM **KANSAS (Continued)**

NAG 5-271	University of Kansas	3358	Determination of the sources of radar scattering
<i>Period</i>	<i>Obligations</i>		
09/01/82-11/30/87	FY89:	TOTAL: \$242,509	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Moore, R. K.	GSFC/Oseroff, H.	55-Agriculture Sci	
Ulaby, F.			
NAG 5-912	University of Kansas	3359	An airborne study of microwave surface and boundary layer heat and moisture fluxes
<i>Period</i>	<i>Obligations</i>		
06/15/87-01/31/90	FY89: \$56,829	TOTAL: \$127,809	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Gogineni, S. P.	GSFC/Levine, E.	39-Env Sci, NEC	
	GSFC/Hall, F.		
NAGW 1242	University of Kansas	3360	To model the magnetic field of Jupiter
<i>Period</i>	<i>Obligations</i>		
12/01/87-11/30/88	FY89:	TOTAL: \$16,958	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Beard, D. B.	HQ-EE/Theis, R. F.	13-Physics	
	HQ-EE/Eastman, T. E.		
NAGW 1278	University of Kansas	3361	Radar scattering from water surfaces
<i>Period</i>	<i>Obligations</i>		
01/01/88-06/30/90	FY89: \$98,994	TOTAL: \$175,479	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Gogineni, P.	HQ-EE/Lagerloef, G. S.	33-Oceanography	
	HQ-EE/Wilson, S. W.		
NAGW 1288	University of Kansas	3362	Topology of large scale structure of the universe
<i>Period</i>	<i>Obligations</i>		
03/01/88-11/30/89	FY89: \$41,990	TOTAL: \$81,653	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Melott, A. L.	HQ-EZ/Clayton, G. C.	11-Astronomy	
NAGW 1357	University of Kansas	3363	Solar lader planetary particles: Development preservation and use of the ionospheres data set
<i>Period</i>	<i>Obligations</i>		
04/01/88-03/31/89	FY89:	TOTAL: \$25,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Armstrong, T. P.	HQ-ES/Mellott, M. M.	13-Physics	
	HQ-ES/Jones, W. V.		
NAGW 1559	University of Kansas	3364	Plasma effects on charged particle transport in comets and in the magnetosphere test particle calculations for space plasmas
<i>Period</i>	<i>Obligations</i>		
03/01/89-02/28/90	FY89: \$54,994	TOTAL: \$54,994	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Cravens, T. E.	HQ-ES/Mellott, M. M.	13-Physics	
	HQ-ES/Perry, T. W.		
NAGW 1588	University of Kansas	3365	Studies in planetary aeronomy
<i>Period</i>	<i>Obligations</i>		
12/01/88-11/30/89	FY89: \$54,998	TOTAL: \$54,998	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Cravens, T. E.	HQ-EL/Bergstralh, J. T.	11-Astronomy	
NAGW 1793	University of Kansas	3366	The theory of gravitational instability
<i>Period</i>	<i>Obligations</i>		
08/01/89-07/31/90	FY89: \$70,000	TOTAL: \$70,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Melott, A. L.	HQ-EZ/Clayton, G. C.	13-Physics	
NASW 4248	University of Kansas	3367	Write a history of NASA space station management 1982-1986
<i>Period</i>	<i>Obligations</i>		
10/13/87-09/12/89	FY89:	TOTAL: \$71,769	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Lewin, T. S.	HQ-LB/Fries, S.	73-History	
Narayanan, V. K.			
NCC 2-175	University of Kansas	3368	Investigation of a free-tip rotor configuration
<i>Period</i>	<i>Obligations</i>		
02/01/82-03/31/89	FY89: \$59	TOTAL: \$230,652	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Lan, C. E.	ARC/Stroub, R. H.	41-Aero Engr	
Fortin, P. E.	ARC/Young, L.		
Kumagai, H.			
NCC 2-351	University of Kansas	3369	Verifying the use of a whirl rig to check free tip rotor system
<i>Period</i>	<i>Obligations</i>		
06/01/85-09/30/89	FY89:	TOTAL: \$174,413	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Fortin, P. E.	ARC/Stroub, R. H.	41-Aero Engr	
Martin, D.	ARC/Young, L. A.		
NCC 2-417	University of Kansas	3370	Modification of rotorcraft dynamics using active controls
<i>Period</i>	<i>Obligations</i>		
09/01/86-09/30/89	FY89:	TOTAL: \$186,169	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Van Aken, J. M.	ARC/Felker, F. F.	41-Aero Engr	
Fortin, P. E.	ARC/Jacklin, S. A.		
NCC 2-588	University of Kansas	3371	Fighter agility metrics research and test
<i>Period</i>	<i>Obligations</i>		
01/01/89-12/31/89	FY89: \$67,272	TOTAL: \$67,272	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Downing, D. R.	ARC/Gera, J.	41-Aero Engr	
Liefer, R. K.	ARC/Clarke, R.		
Valasek, J. L.			
NCC 2-612	University of Kansas	3372	Advanced flight control research for STOVL aircraft
<i>Period</i>	<i>Obligations</i>		
05/15/89-11/14/89	FY89: \$20,000	TOTAL: \$20,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Downing, D. R.	ARC/Lebacqz, J. V.	41-Aero Engr	
	ARC/Franklin, J. A.		
NCC 3-56	University of Kansas	3373	Experimental and analytical investigation of existed turbulent shear layers
<i>Period</i>	<i>Obligations</i>		
01/01/86-01/30/90	FY89: \$50,000	TOTAL: \$214,672	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Farokhi, S.	LERC/Rice, E. J.	41-Aero Engr	

NASA'S UNIVERSITY PROGRAM **KANSAS (Continued)**

NGT 00-050-113 University of Kansas 3374
NASA graduate student researchers program
Period Obligations
08/16/87-08/15/90 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Barr, B. G. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 00-050-285 University of Kansas 3375
NASA graduate student researchers program
Period Obligations
08/01/88-07/31/89 FY89: \$17,000 TOTAL: \$17,000
Prin. Invest. NASA Tech. Officer CASE Category
Moore, R. K. HQ-XE/Owens, F. C. 45-Elec Engr

NGT 00-050-286 University of Kansas 3376
NASA graduate student researchers program
Period Obligations
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Moore, R. K. HQ-XE/Owens, F. C. 45-Elec Engr

NGT 00-050-317 University of Kansas 3377
NASA graduate student researchers program
Period Obligations
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$35,245
Prin. Invest. NASA Tech. Officer CASE Category
Moore, R. K. HQ-XE/Owens, F. C. 45-Elec Engr

NGT 00-050-408 University of Kansas 3378
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Demarest, K. R. HQ-XE/Owens, F. C. 45-Elec Engr

NGT 00-050-464 University of Kansas 3379
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Moore, R. K. HQ-XE/Owens, F. C. 45-Elec Engr

NGT 00-050-472 University of Kansas 3380
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$15,600 TOTAL: \$15,600
Prin. Invest. NASA Tech. Officer CASE Category
Cravens, T. E. HQ-XE/Owens, F. C. 12-Chemistry

NSG 3290 University of Kansas 3381
Self consistent numerical simulation of plasma insulator interactions in space
Period Obligations
08/16/79-06/29/90 FY89: \$56,491 TOTAL: \$514,062
Prin. Invest. NASA Tech. Officer CASE Category
Armstrong, T. P. LERC/Grier, N. T. 13-Physics
Cravens, T. LERC/Stevens, N. J.

NAG 3-566 Wichita State University 3382
Program to verify water droplet trajectory codes
Period Obligations
07/25/84-11/14/89 FY89: \$50,000 TOTAL: \$585,745
Prin. Invest. NASA Tech. Officer CASE Category
Zumwalt, G. W. LERC/Bidwell, G. S. 41-Aero Engr

NAG 3-684 Wichita State University 3383
Water impingement/icing in a highly integrated inlet
Period Obligations
01/07/86-10/31/88 FY89: TOTAL: \$103,928
Prin. Invest. NASA Tech. Officer CASE Category
Zumwalt, G. W. LERC/Bidwell, C. S. 41-Aero Engr

KENTUCKY

NAS 8-36649 Eastern Kentucky University 3384
Study of activation of metal samples including samples from Spacelab 2
Period Obligations
07/01/85-12/31/89 FY89: TOTAL: \$8,999
Prin. Invest. NASA Tech. Officer CASE Category
Laird, C. E. MSFC/Fishman, G. J. 46-Mech Engr
MSFC/Parnehl, T. A.

NAG 1-707 University of Kentucky 3385
Carbon monoxide distributions determinations for a global transport model
Period Obligations
11/01/86-09/30/88 FY89: TOTAL: \$16,383
Prin. Invest. NASA Tech. Officer CASE Category
Peters, L. K. LARC/Reichle, H. G. 31-Atmos Sci
LARC/Wallio, H. A.

NAG 3-912 University of Kentucky 3386
Noise prediction program for gear housing noise
Period Obligations
07/01/88-06/30/90 FY89: \$69,912 TOTAL: \$139,807
Prin. Invest. NASA Tech. Officer CASE Category
Seybert, A. F. LERC/Oswald, F. B. 46-Mech Engr
Wu, T. W.

NAG 5-1184 University of Kentucky 3387
Infrared astronomy satellite far infrared dust emission from clouds and models of the dust emission
Period Obligations
08/01/89-01/31/90 FY89: \$17,750 TOTAL: \$17,750
Prin. Invest. NASA Tech. Officer CASE Category
Clark, F. O. GSFC/West, D. 11-Astronomy

NAG 9-298 University of Kentucky 3388
Use of oscillatory LBNP and spectral analysis to determine cardiovascular adaption to the microgravity environment
Period Obligations
07/01/88-07/01/90 FY89: \$90,000 TOTAL: \$180,000
Prin. Invest. NASA Tech. Officer CASE Category
Knapp, C. F. JSC/Charles, J. B. 56-Medical Sciences

NASW 4186 University of Kentucky 3389
Operation of an Industrial Applications Center
Period Obligations
07/01/86-06/30/90 FY89: \$259,432 TOTAL: \$732,432
Prin. Invest. NASA Tech. Officer CASE Category
Strong, W. R. HQ/Bivins, R. 99-Multi-Discip

NASA'S UNIVERSITY PROGRAM **KENTUCKY (Continued)**

NCC 2-483 University of Kentucky 3390
 Computational studies of atmospheric molecular collision processes important to operation of the aeroassisted orbital transfer vehicle

Period	Obligations	
08/01/87-06/30/89	FY89: \$21,051	TOTAL: \$21,051
Prin. Invest.	NASA Tech. Officer	CASE Category
Pattengill, M. D.	ARC/Jaffe, R. L.	12-Chemistry

NAG 2-386 University of Louisville 3391
 Regulatory mechanism of muscle disuse atrophy in adult rat

Period	Obligations	
11/01/85-10/31/89	FY89: \$58,200	TOTAL: \$231,410
Prin. Invest.	NASA Tech. Officer	CASE Category
Musacchia, X. J.	ARC/Grindeland, R. E.	51-Biological Sci
Steffin, J. M.		
Fell, R. D.		

NAG 9-181 University of Louisville 3392
 Effect of space flight on interferon and interleukin production

Period	Obligations	
10/01/86-10/01/90	FY89: \$35,000	TOTAL: \$135,994
Prin. Invest.	NASA Tech. Officer	CASE Category
Sonnenfeld, G.	JSC/Taylor, G. R.	56-Medical Sciences

NAGW 70 University of Louisville 3393
 Space biology research project

Period	Obligations	
06/01/80-11/30/89	FY89: \$155,000	TOTAL: \$1,748,964
Prin. Invest.	NASA Tech. Officer	CASE Category
Musacchia, X. J.	HQ-EB/Halstead, T. W.	51-Biological Sci

NGT 00-050-021 University of Louisville 3394
 NASA graduate student researchers program

Period	Obligations	
07/01/86-06/30/90	FY89: \$18,000	TOTAL: \$71,898
Prin. Invest.	NASA Tech. Officer	CASE Category
Fell, R. D.	HQ-LE/Owens, F. C.	69-Psych, NEC

LOUISIANA

NAG 2-528 Louisiana State University - Baton Rouge 3395
 Critical review of charged particles astronomy at Saturn. The evidence for co-orbiting material in the inner satellite system

Period	Obligations	
07/01/88-11/30/89	FY89: \$8,305	TOTAL: \$23,305
Prin. Invest.	NASA Tech. Officer	CASE Category
Wefel, J. P.	ARC/Cuzzi, J. N.	11-Astronomy
Cooper, J. F.		

NAG 5-71 Louisiana State University - Baton Rouge 3396
 Ultraviolet spectroscopy of selected astronomical sources

Period	Obligations	
07/01/80-08/31/90	FY89: \$6,000	TOTAL: \$153,674
Prin. Invest.	NASA Tech. Officer	CASE Category
Drilling, J. S.	GSFC/West, D.	11-Astronomy
Hunger, K.		

NAG 5-540 Louisiana State University - Baton Rouge 3397
 Research relative to database interfaces on NASA's heterogeneous database systems

Period	Obligations	
05/15/85-02/15/89	FY89: \$85,000	TOTAL: \$85,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Iyengar, S. S.	GSFC/Jacobs, B.	22-Computer Science
	GSFC/Berbert, J.	

NAG 5-990 Louisiana State University - Baton Rouge 3398
 Element abundance in white dwarfs

Period	Obligations	
08/15/87-08/14/90	FY89: \$13,675	TOTAL: \$30,673
Prin. Invest.	NASA Tech. Officer	CASE Category
Koester, D.	GSFC/West, D.	11-Astronomy

NAG 9-136 Louisiana State University - Baton Rouge 3399
 Investigation of early Archean terrestrial impact ejecta, south Africa and western Australia

Period	Obligations	
03/01/86-05/01/89	FY89: \$53,000	TOTAL: \$53,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Byerly, G. R.	JSC/Phinney, W. C.	32-Geological Sci

NAGW 48 Louisiana State University - Baton Rouge 3400
 Electron positive ion interaction

Period	Obligations	
04/01/80-10/31/89	FY89: \$341,700	TOTAL: \$341,700
Prin. Invest.	NASA Tech. Officer	CASE Category
Henry, R. J.	HQ-EL/Fox, K.	21-Mathematics
	HQ-EL/Quaide, W. L.	

NAGW 1027 Louisiana State University - Baton Rouge 3401
 Composition and transport of galactic cosmic rays

Period	Obligations	
12/01/86-11/30/89	FY89: \$115,000	TOTAL: \$415,500
Prin. Invest.	NASA Tech. Officer	CASE Category
Wefel, J. P.	HQ-ES/Mellott, M. M.	13-Physics
	HQ-ES/Jones, W. V.	

NAGW 1247 Louisiana State University - Baton Rouge 3402
 Cosmic ray positron research and silicon track detector development

Period	Obligations	
12/01/87-11/30/89	FY89: \$140,376	TOTAL: \$444,533
Prin. Invest.	NASA Tech. Officer	CASE Category
Wefel, J. P.	HQ-ES/Mellott, M. M.	13-Physics
	HQ-ES/Jones, W. V.	

NAGW 1526 Louisiana State University - Baton Rouge 3403
 The systematic interpretation of cosmic ray data

Period	Obligations	
01/01/89-12/31/89	FY89: \$84,672	TOTAL: \$84,672
Prin. Invest.	NASA Tech. Officer	CASE Category
Guzik, T. G.	HQ-ES/Mellotte, M. M.	13-Physics
	HQ-ES/Jones, W. V.	

NASA'S UNIVERSITY PROGRAM **LOUISIANA (Continued)**

NAGW 1552 Louisiana State University - Baton Rouge 3404

Application of remote sensing and image processing technologies
 sediment transport and land loss processes coastal Louisiana

Period	Obligations	
07/01/88-09/30/89	FY89: \$111,403	TOTAL: \$111,403
Prin. Invest.	NASA Tech. Officer	CASE Category
Roberts, H. H.	HQ-EE/Lasane, G.	39-Env Sci, NEC

NAG13-4 Louisiana State University - Baton Rouge 3405

Effects of cold front passages on geomorphic evolution and sediment
 dynamics of a river dominated mid latitude coast

Period	Obligations	
02/10/87-06/30/90	FY89: \$74,782	TOTAL: \$221,782
Prin. Invest.	NASA Tech. Officer	CASE Category
Huh, O. K.	SSC/Joyce, A. T.	32-Geological Sci

NAG13-5 Louisiana State University - Baton Rouge 3406

The utility of the airborne electromagnetic profiles for characterization
 of coastal sediments and marsh soils

Period	Obligations	
04/28/87-04/27/88	FY89:	TOTAL: \$20,051
Prin. Invest.	NASA Tech. Officer	CASE Category
Hudnall, W. H.	SSC/Joyce, A. T.	32-Geological Sci

NAS 5-28756 Louisiana State University - Baton Rouge 3407

Utilization of remote sensing of thematic mapper data to improve our
 understanding of estuarine processes and their influences

Period	Obligations	
09/12/85-01/01/89	FY89:	TOTAL: \$171,501
Prin. Invest.	NASA Tech. Officer	CASE Category
Gosselink, J. G.	GSFC/Oseroff, H.	39-Env Sci, NEC

NAS 5-30123 Louisiana State University - Baton Rouge 3408

Assess hardware and software needs to support NASA GSFC India
 ISRO joint science programs in environmental applications

Period	Obligations	
07/15/87-12/31/88	FY89:	TOTAL: \$18,197
Prin. Invest.	NASA Tech. Officer	CASE Category
Hill, M.	GSFC/Stetina, F. L.	19-Phys Sci, NEC
Harlow, C. A.	GSFC/Vermillion, C. H.	

NAS 5-30561 Louisiana State University - Baton Rouge 3409

Assessment of IEMIS, SEAWIFS and SAMS application in developing
 countries

Period	Obligations	
04/26/89-04/25/92	FY89: \$20,197	TOTAL: \$20,197
Prin. Invest.	NASA Tech. Officer	CASE Category
Hill, J. M.	GSFC/Stetina, F.	39-Env Sci, NEC

NCA 2-326 Louisiana State University - Baton Rouge 3410

A solution adaptive grid procedure for high speed flow applications

Period	Obligations	
09/01/88-08/31/90	FY89: \$31,409	TOTAL: \$31,409
Prin. Invest.	NASA Tech. Officer	CASE Category
Acharya, S.	ARC/Holst, T. L.	46-Mech Engr
	ARC/Lawrence, S. L.	

NAG 9-167 Louisiana State University - Shreveport 3411

Study of anti drug motion sickness

Period	Obligations	
07/01/86-06/01/90	FY89: \$49,500	TOTAL: \$196,572
Prin. Invest.	NASA Tech. Officer	CASE Category
Choy, F. K.	JSC/Kutyna, F. A.	56-Medical Sciences
Manno, J. E.		
Redetzi, H. M.		

NAG 9-176 Louisiana Tech University 3412

Design of a blast and ballistic impact protection system for the NASA
 radioisotope thermoelectric generator

Period	Obligations	
09/01/86-01/01/90	FY89: \$24,000	TOTAL: \$93,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Callens, E. E.	JSC/Hoffman, W. C.	46-Mech Engr
Jordan, W. M.	JSC/Graves, T. J.	

NAGW 1225 Northeast Louisiana University 3413

Geologic mapping of the lunae planum outflow region

Period	Obligations	
10/01/87-09/30/90	FY89:	TOTAL: \$11,895
Prin. Invest.	NASA Tech. Officer	CASE Category
Dehon, R. A.	HQ-EL/Underwood, J.	32-Geological Sci
	HQ-EL/Boyce, J. M.	

NAGW 1422 Northeast Louisiana University 3414

Stratigraphy and surface processes in the elysium utopia region of
 Mars

Period	Obligations	
03/01/88-07/31/89	FY89:	TOTAL: \$11,895
Prin. Invest.	NASA Tech. Officer	CASE Category
Dehon, R. A.	HQ-EL/Underwood, J. R.	32-Geological Sci

NSG 7534 Northeast Louisiana University 3415

Stratigraphy and crater morphology

Period	Obligations	
02/01/79-10/15/89	FY89: \$71,700	TOTAL: \$216,767
Prin. Invest.	NASA Tech. Officer	CASE Category
Dehon, R.	HQ-EL/Underwood, J. R.	32-Geological Sci
	HQ-EL/Boyce, J. M.	

NAGW 701 Southern Univ & A&M College 3416

Development of theoretical algorithms and models for pricing
 mechanisms

Period	Obligations	
12/21/84-03/31/90	FY89: \$285,893	TOTAL: \$1,350,990
Prin. Invest.	NASA Tech. Officer	CASE Category
Roquemore, L.	HQ-SU/Halpern, R. E.	21-Mathematics
	HQ-SU/Walker, J.	

NAS 1-15335 Southern Univ & A&M College 3417

Atomic oxygen stimulated outgassing experiment for the long duration
 exposure facility

Period	Obligations	
04/07/78-01/01/91	FY89:	TOTAL: \$72,426
Prin. Invest.	NASA Tech. Officer	CASE Category
Scott, R. L.	LARC/Carter Jr., D. J.	31-Atmos Sci

NASW 4231 Southern Univ & A&M College 3418

Operation of Industrial Application Center for dissemination of NASA
 technology

Period	Obligations	
04/24/87-04/23/92	FY89: \$411,102	TOTAL: \$916,533
Prin. Invest.	NASA Tech. Officer	CASE Category
Roquemore, L.	HQ/Kahn, A. B.	99-Multi-Discip

NASA'S UNIVERSITY PROGRAM
LOUISIANA (Continued)

NGT 00-090-022 Southern Univ & A&M College 3419
 NASA RECON project
Period Obligations
 10/01/88-09/30/89 FY89: \$129,993 TOTAL: \$129,993
Prin. Invest. NASA Tech. Officer CASE Category
 Roquemore, L. HQ-NT/Wilson, J. H. 22-Computer Science
 Mormon, D. HQ-NT/Wente, V. A.

NGT 19-010-900 Southern Univ & A&M College 3420
 NASA recon to train undergraduate scientists and engineers in the use of state of the art scientific and technical information systems
Period Obligations
 07/01/85-12/31/87 FY89: TOTAL: \$109,183
Prin. Invest. NASA Tech. Officer CASE Category
 Roquemore, L. HQ-NI/Wilson, J. 22-Computer Science
 HQ-U/Pohly, J.

NAG 2-101 Tulane University 3421
 Localization and histochemical and physiologic characteristics of the central emetic apparatus related to motion sickness
Period Obligations
 03/01/81-02/28/90 FY89: TOTAL: \$337,735
Prin. Invest. NASA Tech. Officer CASE Category
 Brizzee, K. R. ARC/Mehler, W. R. 56-Medical Sciences
 Norris, C. H. ARC/Corcoran, M. L.
 Pedigo, N. W.

NAG 3-815 Tulane University 3422
 Study of crack growth development in materials with micro defects
Period Obligations
 08/01/87-08/31/89 FY89: TOTAL: \$59,500
Prin. Invest. NASA Tech. Officer CASE Category
 Rubinstein, A. A. LERC/Calomino, A. M. 46-Mech Engr
 LERC/Shannon, J. L.

NAG 3-967 Tulane University 3423
 Modeling of fracture process in fiber reinforced ceramics
Period Obligations
 01/01/89-12/31/89 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. NASA Tech. Officer CASE Category
 Rubenstein, A. A. LERC/Gross, B. 47-Materials Engr

NAGW 1516 Tulane University 3424
 Influences of synaptogenesis on the architecture of vestibular epithelia
Period Obligations
 01/01/89-12/31/89 FY89: \$42,498 TOTAL: \$42,498
Prin. Invest. NASA Tech. Officer CASE Category
 Fermin, C. D. HQ-EB/Halstead, T. W. 59-Life Sci, NEC

NCA 2-370 Tulane University 3425
 Construction of a gene library of an extreme halophile
Period Obligations
 08/01/89-07/31/91 FY89: \$10,000 TOTAL: \$10,000
Prin. Invest. NASA Tech. Officer CASE Category
 Johnson, E. J. ARC/Hochstein, L. L. 51-Biological Sci

NCA 2-800501 Tulane University 3426
 Determination of sequence homology of lac dna sequences of thermus t2 and escherichia coli related to motion sickness
Period Obligations
 01/01/85-08/31/88 FY89: TOTAL: \$10,700
Prin. Invest. NASA Tech. Officer CASE Category
 Johnson, E. J. ARC/MacElroy, R. D. 51-Biological Sci

NGT 00-050-176 Tulane University 3427
 NASA graduate student researchers program
Period Obligations
 07/01/87-06/30/89 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
 Walker, B. R. HQ-XE/Owens, F. C. 56-Medical Sciences

NAG 1-804 University of New Orleans 3428
 Determination of design and operation parameters for upper atmospheric research instrumentation to yield optimum resolution with deconvolution
Period Obligations
 08/01/87-07/31/90 FY89: \$30,362 TOTAL: \$100,067
Prin. Invest. NASA Tech. Officer CASE Category
 Ioup, G. E. LARC/Wood, G. M. 19-Phys Sci, NEC
 Ioup, J. W. LARC/Lewis, B. W.

NCA 2-320 University of New Orleans 3429
 Grain shattering phase transformation and partial vaporization in interstellar shocks
Period Obligations
 05/30/88-05/31/89 FY89: TOTAL: \$12,622
Prin. Invest. NASA Tech. Officer CASE Category
 Seab, C. G. ARC/Hollenbach, D. J. 13-Physics

NCA 2-273 University of Southwestern Louisiana 3430
 Modeling the particulate disks around nearby main sequence stars
Period Obligations
 01/01/88-12/31/88 FY89: TOTAL: \$4,290
Prin. Invest. NASA Tech. Officer CASE Category
 Whitmire, D. P. ARC/Reynolds, R. T. 11-Astronomy
 ARC/Cassen, P. M.

NGT 00-090-004 Xavier University - Louisiana 3431
 Engineering bridge program
Period Obligations
 05/01/87-04/30/90 FY89: \$42,061 TOTAL: \$189,714
Prin. Invest. NASA Tech. Officer CASE Category
 Baker, G. W. HQ-U/Warren, L. 49-Engr, NEC
 HQ-U/Morgolis, M.

NGT 00-090-011 Xavier University - Louisiana 3432
 Project reserve institutional engineering program
Period Obligations
 01/01/88-12/31/89 FY89: \$437,193 TOTAL: \$613,383
Prin. Invest. NASA Tech. Officer CASE Category
 Morning, C. HQ-U/Warren, L. 49-Engr, NEC
 HQ-U/Freeman, Y.

MAINE

NAGW 1719 Bowdoin College 3433
 The effects of gravity on organizing patterns of cell determination in early amphibian embryos
Period Obligations
 02/01/89-01/31/90 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
 Phillips, C. R. HQ-EB/Halstead, T. W. 51-Biological Sci

**NASA'S UNIVERSITY PROGRAM
MAINE (Continued)**

NAG 2-546 Colby College 3434

Super resolution far infrared observations of compact high mass star forming regions on the NASA C-141 Kuiper Airborne Observatory

<i>Period</i>	<i>Obligations</i>	
11/01/88-11/01/89	FY89: \$21,500	TOTAL: \$21,500
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Campbell, M. F.	ARC/Haughney, L. C.	11-Astronomy

NAG 3-576 Colby College 3435

Leo high voltage solar array arcing response model

<i>Period</i>	<i>Obligations</i>	
10/25/84-04/03/90	FY89: \$28,322	TOTAL: \$129,885
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Metz, R. N.	LERC/Snyder, D. B.	45-Elec Engr
	LERC/Purvis, C. K.	

NAG 3-1033 University of Maine - Orono 3436

Numerical prediction of turbulent flame stability in premixed prevaporized HSCT combustors

<i>Period</i>	<i>Obligations</i>	
04/01/89-03/31/90	FY89: \$24,213	TOTAL: \$24,213
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Winowich, N. S.	LERC/Ngayen, H. L.	41-Aero Engr

NAGW 607 University of Maine - Orono 3437

Regulation of methylated gas emission from coastal and inland salt warshes

<i>Period</i>	<i>Obligations</i>	
02/01/84-06/30/88	FY89:	TOTAL: \$118,287
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Margulis, L.	HQ-EB/Averner, M.	99-Multi-Discip
Dacey, J. W.	HQ-EB/Devincenzi, D. L.	
Wakeman, S. G.		

NAGW 1428 University of Maine - Orono 3438

Microbial controls of methane emissions and oxidation in wet land ecosystems

<i>Period</i>	<i>Obligations</i>	
07/01/88-08/31/90	FY89: \$59,305	TOTAL: \$119,305
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
King, G. M.	HQ-EB/Averner, M. M.	54-Env Biology

NAS13-369 University of Maine - Orono 3439

Practical cost effective methods utilizing satellite data for forest resource management

<i>Period</i>	<i>Obligations</i>	
10/06/88-09/30/90	FY89: \$195,977	TOTAL: \$195,977
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Sadar, S. A.	SSC/Hill, C. L.	39-Env Sci, NEC

NGT 00-050-098 University of Maine - Orono 3440

NASA graduate student researchers program

<i>Period</i>	<i>Obligations</i>	
09/01/86-08/31/89	FY89: \$18,000	TOTAL: \$54,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Comins, N. F.	HQ-LE/Owens, F. C.	13-Physics

MARYLAND

NAG 5-499 Bowie State College 3441

Power spectral estimation algorithms for oceanographic applications

<i>Period</i>	<i>Obligations</i>	
02/01/85-09/30/89	FY89:	TOTAL: \$188,018
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Bhatia, M. S.	GSFC/Bonavito, N. L.	29-Math/Computer, NEC
	GSFC/Hurley, E. J.	

NAG 5-715 Bowie State College 3442

Launch vehicle ground truth ephemeris for micro-network applications

<i>Period</i>	<i>Obligations</i>	
09/15/85-04/30/89	FY89:	TOTAL: \$200,012
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Bhatia, M. S.	GSFC/Kork, J.	22-Computer Science

NAG 5-1054 Bowie State College 3443

Automated assembly in space

<i>Period</i>	<i>Obligations</i>	
06/15/88-12/14/89	FY89:	TOTAL: \$74,735
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Srivastava, S.	GSFC/Jones, G. K.	49-Engr, NEC
Dwivedi, S. N.	GSFC/Travis, E. W.	

NAS 5-30296 Bowie State College 3444

Communication cooperation of distributed intelligent systems study

<i>Period</i>	<i>Obligations</i>	
02/19/88-05/19/89	FY89:	TOTAL: \$45,012
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Srivastava, S.	GSFC/Truszkowski, W. F.	22-Computer Science

NGT 00-090-016 Bowie State College 3445

Summer institute on computer applicators

<i>Period</i>	<i>Obligations</i>	
05/15/88-05/14/90	FY89: \$60,034	TOTAL: \$128,669
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Kirksey, C. H.	HQ-U/Margolis, M.	22-Computer Science
	GSFC/Menchan, D.	

NAG 1-1059 Johns Hopkins University 3446

Thermal wave imaging and characterization using microwave sources

<i>Period</i>	<i>Obligations</i>	
09/18/89-09/17/90	FY89: \$30,000	TOTAL: \$30,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Murphy, J. C.	LARC/Winfree, W. P.	13-Physics
	LARC/Heath, D. M.	

NAG 3-728 Johns Hopkins University 3447

Acousto ultrasonic nondestructive evaluation of materials using laser beam generation and detection

<i>Period</i>	<i>Obligations</i>	
06/01/86-05/29/89	FY89:	TOTAL: \$249,999
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Green, R. F., Jr.	LERC/Vary, A.	47-Materials Engr
Palmer, C. H.	LERC/Kautz, H. E.	

NAG 5-32 Johns Hopkins University 3448

Interpretation and delineation of the Earth's gravity field

<i>Period</i>	<i>Obligations</i>	
04/01/80-05/31/90	FY89: \$63,205	TOTAL: \$480,719
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Poirier, D. R.	GSFC/Welker, J.	32-Geological Sci
Heinrich, J. C.		
Pertstein, A. J.		

**NASA'S UNIVERSITY PROGRAM
MARYLAND (Continued)**

NAG 5-327	Johns Hopkins University	3449	NAG 5-1099	Johns Hopkins University	3457
Optical studies of potential spectroscopic instruments			Data interfaces for the ISTP ground based dark dual radar network		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
06/01/83-02/28/90	FY89: TOTAL: \$116,000		11/01/88-10/31/89	FY89: \$115,000 TOTAL: \$115,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Moos, W.	GSFC/Brien, J. J.	11-Astronomy	Greenwald, R. A.	GSFC/Curtis, S. A.	13-Physics
	GSFC/Leckrone, D. S.			GSFC/Acuna, M. H.	
NAG 5-356	Johns Hopkins University	3450	NAG 5-1119	Johns Hopkins University	3458
Optical communication with laser diode arrays			Multi pinned phase CCO detector for use as a star tracker		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
08/01/83-02/28/90	FY89: \$100,768 TOTAL: \$440,068		02/01/89-01/31/90	FY89: \$116,315 TOTAL: \$116,315	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Davidson, F. M.	GSFC/Abshire, J. B.	45-Elec Engr	Friedman, S. D.	GSFC/Sonneborn, G.	11-Astronomy
	GSFC/Degnan, J. J.			GSFC/Woodgate, B. E.	
NAG 5-619	Johns Hopkins University	3451	NAG 5-1194	Johns Hopkins University	3459
Rocket and laboratory experiments in aeronomy and astronomy			New methods for analyzing variability data in space astronomy		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
03/01/83-02/28/90	FY89: \$565,000 TOTAL: \$4,003,000		08/15/89-08/14/90	FY89: \$31,000 TOTAL: \$31,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Feldman, P. D.	GSFC/Early, L. J.	13-Physics	Krolik, J. H.	GSFC/West, D.	11-Astronomy
Davidson, A. F.	GSFC/Pless, R. H.				
Fastie, W. G.					
NAG 5-759	Johns Hopkins University	3452	NAG 5-1276	Johns Hopkins University	3460
Broadband electrostatic noise and ion beam dynamics in the magnetotail			Detailed analysis of Voyager observations of supernova remnants		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
04/15/86-11/30/89	FY89: TOTAL: \$110,892		10/01/89-03/31/90	FY89: \$20,000 TOTAL: \$20,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Lui, A. T.	GSFC/Wales, R.	13-Physics	Blair, W.	GSFC/West, D.	11-Astronomy
Mankofsky, A.					
NAG 5-796	Johns Hopkins University	3453	NAG 5-1282	Johns Hopkins University	3461
Mesospheric dynamics and chemistry from solar mesospheric experiments			Iras-ADP study of dust near luminous ultraviolet		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
07/01/86-12/31/88	FY89: TOTAL: \$43,881		10/01/89-09/30/90	FY89: \$30,000 TOTAL: \$30,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Strobel, D. F.	GSFC/Schoeberl, M. R.	31-Atmos Sci	Henry, R. C.	GSFC/West, D.	11-Astronomy
NAG 5-877	Johns Hopkins University	3454	NAG 8-676	Johns Hopkins University	3462
The anodic dissolution of cosmium in alkaline electrolyte			The mass and dynamics of clusters of galaxies		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
02/15/87-03/31/90	FY89: \$9,500 TOTAL: \$52,114		08/01/87-07/31/90	FY89: \$21,107 TOTAL: \$67,532	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Prentice, G.	GSFC/Yi, T. Y.	43-Chem Engr	Kriss, G. A.	MSFC/Harrisik, D. M.	11-Astronomy
			Ferguson, H. C.		
NAG 5-988	Johns Hopkins University	3455	NAG 8-677	Johns Hopkins University	3463
Ultraviolet observations of astronomical phenomena			X ray IR study of supernova remnants with field center X ray morphologies		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
09/01/87-02/28/91	FY89: \$73,901 TOTAL: \$121,501		09/01/87-02/28/89	FY89: TOTAL: \$24,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Blair, W. P.	GSFC/West, D.	11-Astronomy	Long, K. S.	MSFC/Harper, B. A.	11-Astronomy
Long, K. S.			White, R. L.		
NAG 5-1096	Johns Hopkins University	3456	NAG 9-217	Johns Hopkins University	3464
An extreme ultraviolet excess elliptical galaxy			Structural analysis of the Archean slave province as a key to understanding Archean tectonic processes		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
10/15/88-10/14/89	FY89: \$10,600 TOTAL: \$10,600		03/01/87-04/01/89	FY89: TOTAL: \$45,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Wyse, R.	GSFC/Kondo, Y.	11-Astronomy	Depaor, D.	JSC/Phinney, W. C.	32-Geological Sci

**NASA'S UNIVERSITY PROGRAM
MARYLAND (Continued)**

NAGW 522 Johns Hopkins University 3465
Study of a solar magnetograph
Period *Obligations*
12/01/83-10/31/89 FY89: \$50,000 TOTAL: \$641,957
Prin. Invest. NASA Tech. Officer CASE Category
Rust, D. M. HQ-ES/Bohlin, J. D. 13-Physics

NAGW 648 Johns Hopkins University 3466
Planetary aeronomy
Period *Obligations*
09/01/84-10/31/90 FY89: \$95,000 TOTAL: \$489,896
Prin. Invest. NASA Tech. Officer CASE Category
Strobel, D. F. HQ-EL/Bergstrahl, J. T. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NAGW 773 Johns Hopkins University 3467
Energetic neutral atoms: Imaging the magnetospheric ring current
Period *Obligations*
05/01/85-10/31/89 FY89: \$90,000 TOTAL: \$300,000
Prin. Invest. NASA Tech. Officer CASE Category
Roelof, E. C. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Perry, T. W.

NAGW 820 Johns Hopkins University 3468
Prospecting for mantle plumes using satellite geoid and gravity data
Period *Obligations*
11/01/85-04/30/88 FY89: TOTAL: \$99,967
Prin. Invest. NASA Tech. Officer CASE Category
Olson, P. L. HQ-E/Rosendhal, J. D. 32-Geological Sci
HQ-EP/Konkel, R. M.

NAGW 826 Johns Hopkins University 3469
Middle atmosphere radiation and modeling
Period *Obligations*
12/01/85-09/30/88 FY89: TOTAL: \$45,980
Prin. Invest. NASA Tech. Officer CASE Category
Strobel, D. F. HQ-EE/Smith, M. A. 31-Atmos Sci
HQ-EE/Butler, D. M.

NAGW 865 Johns Hopkins University 3470
Imaging neutral particle detector
Period *Obligations*
01/01/86-12/31/89 FY89: TOTAL: \$299,463
Prin. Invest. NASA Tech. Officer CASE Category
Krimigas, S. M. HQ-E/Alexander, J. K. 11-Astronomy
HQ-EP/Konkel, R. M.

NAGW 1017 Johns Hopkins University 3471
The intermediate zone in active galactic nuclei
Period *Obligations*
01/01/87-12/31/89 FY89: \$42,156 TOTAL: \$122,157
Prin. Invest. NASA Tech. Officer CASE Category
Krolik, J. H. HQ-EC/Clayton, G. C. 13-Physics
HQ-EZ/Boggess, N. W.

NAGW 1098 Johns Hopkins University 3472
Support of the 20th general assembly of the International Astronomical Union on Baltimore 1988
Period *Obligations*
05/01/87-12/31/88 FY89: TOTAL: \$269,936
Prin. Invest. NASA Tech. Officer CASE Category
Davidsen, A. F. HQ-EZ/Peterson, L. E. 11-Astronomy
HQ-EZ/Brinton, H. C.

NAGW 1578 Johns Hopkins University 3473
Dynamical processes in the corona and solar wind
Period *Obligations*
02/01/89-01/31/90 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
Roelof, E. C. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Jones, W. V.

NAGW 1650 Johns Hopkins University 3474
Correlative studies of solar planetary relationships magnetospheric currents waves and boundaries
Period *Obligations*
01/01/89-12/31/89 FY89: \$100,000 TOTAL: \$100,000
Prin. Invest. NASA Tech. Officer CASE Category
Pstemma, T. A. HQ-ES/Mellott, M. M. 13-Physics

NAGW 1748 Johns Hopkins University 3475
Pair plasma dynamics
Period *Obligations*
04/01/89-05/31/90 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
Krolik, J. H. HQ-EZ/Kaluzienski, L. J. 11-Astronomy

NAGW 1750 Johns Hopkins University 3476
Mantle plume dynamics in the terrestrial planets
Period *Obligations*
04/01/89-03/31/90 FY89: \$15,000 TOTAL: \$15,000
Prin. Invest. NASA Tech. Officer CASE Category
Olson, P. HQ-EL/Underwood, J. R. 32-Geological Sci

NAS 5-25358 Johns Hopkins University 3477
Grating facility use
Period *Obligations*
10/01/78-12/31/89 FY89: TOTAL: \$68,200
Prin. Invest. NASA Tech. Officer CASE Category
Fastie, W. G. GSFC/Fowler, W. S. 13-Physics

NAS 5-26848 Johns Hopkins University 3478
Multi-spectral auroral imaging device for OPEN (origin of plasmas in the Earth's neighborhood)
Period *Obligations*
12/20/82-12/31/90 FY89: TOTAL: \$318,500
Prin. Invest. NASA Tech. Officer CASE Category
Feldman, P. D. GSFC/Wainscott, F. 19-Phys Sci, NEC

NAS 5-27000 Johns Hopkins University 3479
Development phase of the Hopkins ultraviolet telescope (HUT)
Period *Obligations*
09/21/81-02/28/94 FY89: \$2,184,300 TOTAL: \$21,377,000
Prin. Invest. NASA Tech. Officer CASE Category
Davidsen, A. MSFC/Jayroe, R. R. 11-Astronomy

NAS 5-29259 Johns Hopkins University 3480
Space telescope guaranteed time observation program
Period *Obligations*
01/16/86-05/31/90 FY89: \$105,000 TOTAL: \$270,000
Prin. Invest. NASA Tech. Officer CASE Category
Fastie, W. G. GSFC/Kalinoski, J. K. 41-Aero Engr

NAS 5-30339 Johns Hopkins University 3481
Far ultraviolet spectroscopic Explorer lyman mission
Period *Obligations*
06/10/88-07/02/89 FY89: \$193,246 TOTAL: \$352,372
Prin. Invest. NASA Tech. Officer CASE Category
Moos, W. GSFC/O'Brien, J. 11-Astronomy

NASA'S UNIVERSITY PROGRAM
MARYLAND (Continued)

NAS 5-30403	Johns Hopkins University	3482	NGT 00-050-486	Johns Hopkins University	3491
Stis CO investigator			NASA graduate student researchers program		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
02/04/88-12/30/89	FY89: \$18,000	TOTAL: \$24,000	07/01/89-06/30/90	FY89: \$18,000	TOTAL: \$18,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Moos, W.	GSFC/Vitablano, D.	41-Aero Engr	Prosperetti, A.	HQ-XE/Owens, F. C.	46-Mech Engr
NAS 8-32903	Johns Hopkins University	3483	NSG 1442	Johns Hopkins University	3492
Scientific investigations in support of the space telescope project			Intermittent/transient faults in computer based systems		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
02/01/78-09/30/89	FY89: \$4,000	TOTAL: \$246,040	09/15/77-02/28/90	FY89: \$100,000	TOTAL: \$779,987
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Fastie, W. G.	MSFC/Taylor, W. E.	11-Astronomy	Masson, G. E.	LARC/Pitts, F. L. LARC/Belcastro, C. M.	45-Elec Engr
NASW 4375	Johns Hopkins University	3484	NSG 5393	Johns Hopkins University	3493
Future prospects for multispectral satellite observations of the Earth			Studies of the ultraviolet spectra of astronomical sources		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
07/12/89-08/31/89	FY89: \$52,000	TOTAL: \$52,000	07/01/79-09/30/90	FY89: \$100,500	TOTAL: \$875,352
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Edelson, B. I.	HQ-EE/Pilford, S. G. HQ-EE/Lesane, G. A.	99-Multi-Discip	Moos, H. W. Feldman, P. D. Luhmann, J. G.	GSFC/West, D.	11-Astronomy
NCA 2-171	Johns Hopkins University	3485	NSG 7055	Johns Hopkins University	3494
Visual attention and the perception of objects			Satellite data analysis		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
11/01/86-10/31/88	FY89:	TOTAL: \$52,062	01/01/74-06/30/89	FY89:	TOTAL: \$1,379,040
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Yantis, S.	ARC/Johnston, J. C.	61-Biol Aspects	Potemra, T. A.	HQ-EE/Mellott, M. M. HQ-EE/Eastman, T. E.	13-Physics
NCA 2-413	Johns Hopkins University	3486	NCA 5-104	Morgan State University	3495
Dynamics of Visual Attention Allocation Interchange			Technology transfer		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
06/01/89-05/31/91	FY89: \$19,466	TOTAL: \$19,466	06/06/85-09/30/88	FY89:	TOTAL: \$57,705
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Yantis, S.	ARC/Johnston, J. C.	69-Psych, NEC	Taylor, J.	GSFC/Friedmen, D. S.	99-Multi-Discip
NCC 2-555	Johns Hopkins University	3487	NCA 5-105	Morgan State University	3496
Fatigue pilot deviation and time of day			Engineering enrichment program		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
07/15/88-06/30/89	FY89:	TOTAL: \$11,376	06/26/85-05/31/90	FY89: \$49,000	TOTAL: \$232,901
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Baker, S. P.	ARC/Graeber, R. C.	99-Multi-Discip	White, C.	GSFC/Menchan, D.	49-Engr, NEC
NGT 00-050-033	Johns Hopkins University	3488	NGT 00-090-005	Morgan State University	3497
NASA graduate student researchers program			NASA summer institute for SIMNET program		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
06/01/86-05/31/89	FY89:	TOTAL: \$46,600	05/15/87-12/15/88	FY89:	TOTAL: \$121,200
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Davidson, A. F.	HQ-LE/Owens, F. C.	13-Physics	Deloatch, E.	HQ-U/Warren, L.	49-Engr, NEC
NGT 00-050-054	Johns Hopkins University	3489	NGT 00-090-019	Morgan State University	3498
NASA graduate student researchers program			Summer graduate intern program		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
09/01/86-08/31/89	FY89: \$18,000	TOTAL: \$54,000	05/16/88-10/16/88	FY89:	TOTAL: \$71,162
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Paor, D. D.	HQ-LE/Owens, F. C.	55-Agriculture Sci	Proctor, N.	HQ-U/Freeman, Y. B. GSFC/Menchan, D.	49-Engr, NEC
NGT 00-050-060	Johns Hopkins University	3490			
NASA graduate student researchers program					
<i>Period</i>	<i>Obligations</i>				
09/01/86-08/31/89	FY89: \$18,000	TOTAL: \$54,000			
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>			
Moudrianakis, E. N.	HQ-LE/Owens, F. C.	51-Biological Sci			

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NSG 5074 Morgan State University 3499			
Research calibration of photographic and spectrographic films			
<i>Period</i>	<i>Obligations</i>		
10/01/75-01/31/90	FY89: \$61,064	TOTAL: \$1,531,091	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hammond, E. C., Jr.	GSFC/Baker, G. R.	11-Astronomy	
	GSFC/Stober, A. K.		
NAG 3-979 Mount Saint Mary's College 3500			
Determination of oxygen stoichiometry in high temperature superconducting ceramics			
<i>Period</i>	<i>Obligations</i>		
01/15/89-01/15/90	FY89: \$6,160	TOTAL: \$6,160	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Richman, R. M.	LERC/Leonard, R. F.	12-Chemistry	
NAG 8-625 St John's College Main Campus 3501			
X ray spectra of radio bright active galactic nuclei detected by HEAO A1 under the HEAO 2 guest investigator program			
<i>Period</i>	<i>Obligations</i>		
03/03/87-12/31/88	FY89:	TOTAL: \$17,930	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Beall, J. H.	MSFC/Potter, P. Y.	31-Atmos Sci	
NAG 5-733 Towson State University 3502			
Holographic recording of cosmic ray tracks			
<i>Period</i>	<i>Obligations</i>		
02/01/86-05/31/89	FY89:	TOTAL: \$17,746	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Huang, J. W.	GSFC/Balasubrahmanya, V. K.	13-Physics	
Loh, E. L.	GSFC/Streitmatter, R. E.		
NAG 5-509 University of Maryland - Baltimore 3503			
High resolution spectroscopy of carbon dioxide lineshapes			
<i>Period</i>	<i>Obligations</i>		
03/01/85-06/30/90	FY89:	TOTAL: \$87,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Strow, L. L.	GSFC/Gentry, B.	13-Physics	
	GSFC/Korb, C. L.		
NAG 5-1272 University of Maryland - Baltimore 3504			
Analysis of IUE spectra of comets			
<i>Period</i>	<i>Obligations</i>		
09/15/89-12/14/89	FY89: \$5,000	TOTAL: \$5,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
A'hearn, M. F.	GSFC/West, D.	11-Astronomy	
NAG 9-249 University of Maryland - Baltimore 3505			
Determination of the pharmacology of lidocaine tobramycin and theophyllin in a zero G environment and on Earth			
<i>Period</i>	<i>Obligations</i>		
08/01/87-06/01/90	FY89: \$44,550	TOTAL: \$223,190	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Drusano, G. L.	JSC/Kutyna, F. A.	56-Medical Sciences	
NAGW 1020 University of Maryland - Baltimore 3506			
Vibration and rotation lineshapes of atmospheric constituents			
<i>Period</i>	<i>Obligations</i>		
03/01/87-06/15/90	FY89: \$48,166	TOTAL: \$143,166	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Strow, L. L.	HQ-EE/Kurylo, M. J.	31-Atmos Sci	
	HQ-EE/Watson, R. T.		
NAS 5-33022 University of Maryland - Baltimore 3507			
EOS interdisciplinary study			
<i>Period</i>	<i>Obligations</i>		
08/16/89-02/28/91	FY89: \$50,000	TOTAL: \$50,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Strow, L.	GSFC/Soffen, G.	13-Physics	
NAG 1-375 University of Maryland - College Park 3508			
Gust response of articulated and hingeless rotors in hover and forward flight			
<i>Period</i>	<i>Obligations</i>		
06/01/83-08/31/87	FY89:	TOTAL: \$166,477	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Chopra, I.	LARC/Mantay, W. R.	41-Aero Engr	
NAG 1-620 University of Maryland - College Park 3509			
Studies of high temperature nonequilibrium flow fields			
<i>Period</i>	<i>Obligations</i>		
11/01/85-10/31/88	FY89:	TOTAL: \$150,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Anderson, J. D.	LARC/Gnoffo, P. A.	41-Aero Engr	
Kothari, A. P.			
NAG 1-665 University of Maryland - College Park 3510			
Innovative design of composite structures			
<i>Period</i>	<i>Obligations</i>		
05/01/86-10/31/89	FY89:	TOTAL: \$112,398	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hyer, M. W.	LARC/Nemeth, M. P.	41-Aero Engr	
NAG 1-681 University of Maryland - College Park 3511			
Studies in general aviation aerodynamics			
<i>Period</i>	<i>Obligations</i>		
07/01/86-09/30/89	FY89:	TOTAL: \$30,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Winkelmann, A. E.	LARC/Dicarlo, D. J.	41-Aero Engr	
	LARC/Jordan, F. L., Jr.		
NAG 1-739 University of Maryland - College Park 3512			
Aeroelastic optimization of a helicopter rotor			
<i>Period</i>	<i>Obligations</i>		
02/01/87-01/31/90	FY89:	TOTAL: \$110,365	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Chopra, I.	LARC/Walsh, J. L.	41-Aero Engr	
	LARC/Noonan, K. W.		
NAG 1-853 University of Maryland - College Park 3513			
Aeroelastic stability analysis of variable speed composite gimbaled rotor			
<i>Period</i>	<i>Obligations</i>		
02/05/88-02/04/90	FY89: \$25,018	TOTAL: \$74,896	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Chodra, I.	LARC/Nixon, M. W.	41-Aero Engr	
	LARC/Kvaternik, R. C.		
NAG 1-885 University of Maryland - College Park 3514			
Dynamic planning with connectionist models			
<i>Period</i>	<i>Obligations</i>		
06/01/88-05/31/90	FY89: \$73,730	TOTAL: \$125,083	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Reggia, J. A.	LARC/Solonay, D.	22-Computer Science	

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NAG 1-985 University of Maryland - College Park 3515
 Aeroelastic optimization of a helicopter rotor

<i>Period</i>	<i>Obligations</i>	
04/01/89-03/31/90	FY89: \$61,010	TOTAL: \$61,010
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Chopra, I.	LARC/Walsh, J. L.	41-Aero Engr
	LARC/Noonan, K. W.	

NAG 2-270 University of Maryland - College Park 3516
 Properties of large nearly perfect crystals at very low temperatures

<i>Period</i>	<i>Obligations</i>	
01/01/84-01/31/89	FY89: \$20,000	TOTAL: \$180,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Richard, J. P.	ARC/Kittel, P.	13-Physics
Weber, J.		
Nelson, R. A.		

NAG 2-409 University of Maryland - College Park 3517
 Aeroelastic stability analysis of berringless rotors in forward flight

<i>Period</i>	<i>Obligations</i>	
06/01/86-05/31/90	FY89: \$97,419	TOTAL: \$274,219
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Chopra, I.	ARC/Graham, T. A.	41-Aero Engr
	ARC/Peterson, R. L.	

NAG 2-529 University of Maryland - College Park 3518
 Hypersonic nonequilibrium chemically reacting separated flows

<i>Period</i>	<i>Obligations</i>	
07/01/88-09/30/89	FY89:	TOTAL: \$75,111
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Anderson, J. D.	ARC/Deiwert, G. S.	41-Aero Engr

NAG 2-557 University of Maryland - College Park 3519
 High resolution far infrared studies of compact regions of star forming molecular clouds

<i>Period</i>	<i>Obligations</i>	
10/01/88-09/30/89	FY89: \$17,990	TOTAL: \$17,990
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Mundy, L. G.	ARC/Haughney, L. C.	11-Astronomy

NAG 3-849 University of Maryland - College Park 3520
 Project zena critical fluid light scattering experiment

<i>Period</i>	<i>Obligations</i>	
12/15/87-06/15/89	FY89:	TOTAL: \$717,982
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Gammon, R. W.	LERC/Lauver, R. W.	13-Physics

NAG 5-203 University of Maryland - College Park 3521
 Satellite sensing of air pollution and ground signatures

<i>Period</i>	<i>Obligations</i>	
09/01/81-12/31/89	FY89: \$51,826	TOTAL: \$673,709
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Pinker, R. T.	GSFC/Fraser, R. S.	31-Atmos Sci
Kaufman, Y. J.	GSFC/Tucker, C. J.	
Ferrare, R. A.		

NAG 5-216 University of Maryland - College Park 3522
 Thermodynamic and spectroscopic studies relevant to a Jovian satellite

<i>Period</i>	<i>Obligations</i>	
01/15/82-05/31/90	FY89: \$39,938	TOTAL: \$205,192
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Khanna, R. K.	GSFC/Pearl, J. C.	11-Astronomy

NAG 5-245 University of Maryland - College Park 3523
 Planetary studies through interpretation of satellite data

<i>Period</i>	<i>Obligations</i>	
06/15/82-12/31/89	FY89: \$444,210	TOTAL: \$1,485,399
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Bell, R. A.	GSFC/Freg, H.	32-Geological Sci
Trosco, J. D.		

NAG 5-252 University of Maryland - College Park 3524
 Satellite observations of distant dusty comets

<i>Period</i>	<i>Obligations</i>	
03/01/87-07/31/90	FY89: \$20,500	TOTAL: \$145,400
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
A'hearn, M. F.	GSFC/West, D.	11-Astronomy
McFadden, L. A.		
Schleicher, D. G.		

NAG 5-396 University of Maryland - College Park 3525
 System characterization of a magnetically suspended flywheel

<i>Period</i>	<i>Obligations</i>	
02/15/84-07/31/90	FY89:	TOTAL: \$573,859
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Kirk, J. A.	GSFC/Rodriguez, G. E.	46-Mech Engr
Whittaker, L. M.	GSFC/Kichak, R. A.	

NAG 5-422 University of Maryland - College Park 3526
 Design study for a high sensitivity electron spectrometer

<i>Period</i>	<i>Obligations</i>	
07/01/84-08/31/89	FY89:	TOTAL: \$125,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Coplan, M. A.	GSFC/Hoffman, R. A.	13-Physics
Moore, J. H.		

NAG 5-454 University of Maryland - College Park 3527
 Study of selected radiations at high altitudes above the auroral

<i>Period</i>	<i>Obligations</i>	
07/15/84-05/31/89	FY89:	TOTAL: \$75,447
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Wu, C. S.	GSFC/Bullock, G. D.	19-Phys Sci, NEC
	GSFC/Hoffman, R. A.	

NAG 5-579 University of Maryland - College Park 3528
 Analysis of the results of the ion composition instrument

<i>Period</i>	<i>Obligations</i>	
07/01/85-10/14/88	FY89:	TOTAL: \$283,970
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Coplan, M. A.	GSFC/Ogilvie, K. W.	13-Physics

NAG 5-705 University of Maryland - College Park 3529
 Research relative to the IMP ion and electron experiment data

<i>Period</i>	<i>Obligations</i>	
10/01/85-11/30/89	FY89: \$70,488	TOTAL: \$287,138
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Ipavich, F. A.	GSFC/Wales, R. O.	11-Astronomy
Galvin, A. B.		
Mason, G. M.		

NAG 5-716 University of Maryland - College Park 3530
 Analysis of data from the charge-energy-mass spectrometer

<i>Period</i>	<i>Obligations</i>	
10/01/85-05/14/90	FY89: \$254,000	TOTAL: \$1,190,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Gloeckner, S.	GSFC/Curtis, S.	13-Physics
Hamilton, D.		
Ipavich, F.		

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NAG 5-723 University of Maryland - College Park 3531
 Studies of energetic particles in the solar terrestrial environment

Period	Obligations	
12/01/85-12/31/89	FY89: \$15,000	TOTAL: \$187,700
Prin. Invest.	NASA Tech. Officer	CASE Category
Bell, R.	GSFC/Jones, F. C.	11-Astronomy

NAG 5-728 University of Maryland - College Park 3532
 Nuclear and ionic charge distribution experiments

Period	Obligations	
02/01/86-12/31/89	FY89: \$142,000	TOTAL: \$563,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Gloekler, G.	GSFC/Wales, R. O.	11-Astronomy
Spavick, F. M.		

NAG 5-730 University of Maryland - College Park 3533
 Satellite temperature sounding for regional weather prediction models

Period	Obligations	
01/15/86-11/30/89	FY89: \$17,395	TOTAL: \$223,569
Prin. Invest.	NASA Tech. Officer	CASE Category
Thompson, O. E.	GSFC/Susskind, J.	31-Atmos Sci
Dazlich, D. A.		

NAG 5-731 University of Maryland - College Park 3534
 Measuring mean tropospheric winds by means of an aerosol tracking spaceborne lidar system

Period	Obligations	
01/08/86-02/07/90	FY89: \$38,169	TOTAL: \$299,226
Prin. Invest.	NASA Tech. Officer	CASE Category
Pinker, R. T.	GSFC/Spinhrne, J. D.	31-Atmos Sci
Boers, R.	GSFC/Melfi, S. H.	

NAG 5-776 University of Maryland - College Park 3535
 Designing a new processor chips for the massively parallel processor

Period	Obligations	
05/15/86-08/14/88	FY89:	TOTAL: \$97,971
Prin. Invest.	NASA Tech. Officer	CASE Category
Ja Ja, J.	GSFC/Dorband, J. E.	45-Elec Engr
	GSFC/Fischer, J. R.	

NAG 5-783 University of Maryland - College Park 3536
 Parameterization of cloudiness in climate models

Period	Obligations	
05/01/86-09/30/88	FY89:	TOTAL: \$184,986
Prin. Invest.	NASA Tech. Officer	CASE Category
Baer, F.	GSFC/Thiele, O. W.	31-Atmos Sci
Harshvardhan		

NAG 5-866 University of Maryland - College Park 3537
 Calculation of the global hydrologic cycle through repeated insertions of available satellite and surface observations

Period	Obligations	
01/01/87-01/31/90	FY89: \$50,000	TOTAL: \$179,029
Prin. Invest.	NASA Tech. Officer	CASE Category
Baer, F. E.	GSFC/Sud, Y.	31-Atmos Sci
Mintz, Y.		

NAG 5-867 University of Maryland - College Park 3538
 Remote sensing of the atmosphere two level analysis the Africa drought

Period	Obligations	
01/01/87-01/31/90	FY89: \$267,837	TOTAL: \$874,198
Prin. Invest.	NASA Tech. Officer	CASE Category
Baer, F. E.	GSFC/Peslen, C. A.	31-Atmos Sci
Mintz, Y.		

NAG 5-892 University of Maryland - College Park 3539
 Modeling of vegetation atmosphere interactions for the first ISLSCP field experiment

Period	Obligations	
04/15/87-03/14/90	FY89: \$129,314	TOTAL: \$251,758
Prin. Invest.	NASA Tech. Officer	CASE Category
Sellers, P. J.	GSFC/Toll, D. L.	39-Env Sci, NEC
Paw, K. T.	GSFC/Hall, F.	

NAG 5-903 University of Maryland - College Park 3540
 Measurement of evapotranspiration with combined multispectral solar reflective and thermal infrared radiance observations

Period	Obligations	
05/01/87-01/31/90	FY89: \$53,000	TOTAL: \$154,662
Prin. Invest.	NASA Tech. Officer	CASE Category
Goward, S. N.	GSFC/Choudhury, B.	39-Env Sci, NEC
Hope, A.	GSFC/Hall, F.	

NAG 5-907 University of Maryland - College Park 3541
 Canopy photosynthesis and resistance measurements for the first ISLSCP field experiment

Period	Obligations	
05/01/87-05/31/89	FY89:	TOTAL: \$26,755
Prin. Invest.	NASA Tech. Officer	CASE Category
Sellers, P.	GSFC/Levine, E.	39-Env Sci, NEC
	GSFC/Hall, F.	

NAG 5-914 University of Maryland - College Park 3542
 Mesoscale surface radiation budgets from satellite observations derivation and validation

Period	Obligations	
07/01/87-06/30/90	FY89: \$70,000	TOTAL: \$194,239
Prin. Invest.	NASA Tech. Officer	CASE Category
Pinker, R. T.	GSFC/Chou, M. D.	31-Atmos Sci

NAG 5-923 University of Maryland - College Park 3543
 Integrated transmission of mixed communication traffic types with different bandwidth requirements

Period	Obligations	
06/01/87-06/30/90	FY89: \$25,062	TOTAL: \$132,781
Prin. Invest.	NASA Tech. Officer	CASE Category
Narayan, P.	GSFC/Morakis, J. C.	49-Engr, NEC
Lambadaris, I.	GSFC/Miller, W. H.	

NAG 5-924 University of Maryland - College Park 3544
 Feasibility of using Auger spectroscopy for remote sensing of planetary surfaces

Period	Obligations	
06/15/87-01/31/90	FY89: \$5,000	TOTAL: \$17,019
Prin. Invest.	NASA Tech. Officer	CASE Category
Adler, I.	GSFC/Tanner, R.	19-Phys Sci, NEC
Moor, J.		
Coplan, M.		

NAG 5-942 University of Maryland - College Park 3545
 Monitoring the grasslands of sub Saharan Africa

Period	Obligations	
07/01/87-02/28/90	FY89: \$102,500	TOTAL: \$223,158
Prin. Invest.	NASA Tech. Officer	CASE Category
Justice, C. O.	GSFC/Tucker, C. J.	39-Env Sci, NEC
Goward, S. N.	GSFC/Holben, B. N.	

NASA'S UNIVERSITY PROGRAM
MARYLAND (Continued)

NAG 5-950 University of Maryland - College Park 3546
 Numerical studies of shock acceleration in solar flares

Period	Obligations	
08/01/87-07/31/88	FY89:	TOTAL: \$30,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Goodrich, C. C.	GSFC/Bullock, A. D.	19-Phys Sci, NEC
Cargill, P. J.	GSFC/Gurman, J. B.	

NAG 5-1079 University of Maryland - College Park 3554
 A multifrequency investigation for evidence of anisotropic continuum emission in Seyferts

Period	Obligations	
10/01/88-09/30/90	FY89: \$40,000	TOTAL: \$80,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Wilson, A.	GSFC/West, D.	11-Astronomy

NAG 5-955 University of Maryland - College Park 3547
 Space station systems engineering

Period	Obligations	
08/01/87-01/31/90	FY89:	TOTAL: \$150,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Anand, D. K.	GSFC/Ford, F. E.	49-Engr, NEC
Kirk, J. A.	GSFC/Sabelhaus, P. A.	

NAG 5-1094 University of Maryland - College Park 3555
 Structure seasonal cycle nature general circulation models

Period	Obligations	
10/01/88-09/30/90	FY89: \$81,000	TOTAL: \$121,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Straus, D.	GSFC/Schubert, S.	31-Atmos Sci
Shukla, J.		

NAG 5-968 University of Maryland - College Park 3548
 Ultramafic lithologies province boundaries and Archean crustal evolution

Period	Obligations	
07/15/87-07/31/90	FY89:	TOTAL: \$62,801
Prin. Invest.	NASA Tech. Officer	CASE Category
McLellan, E.	GSFC/Bell, R.	32-Geological Sci
Siegrist, H. G.	GSFC/Heitzler, J. R.	

NAG 5-1101 University of Maryland - College Park 3556
 Comprehensive theoretical and computational modeling program ISTP

Period	Obligations	
12/01/88-11/30/89	FY89: \$115,000	TOTAL: \$115,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Papadopoulos, K.	GSFC/Curtis, S. A.	13-Physics
	GSFC/Acuna, M. H.	

NAG 5-969 University of Maryland - College Park 3549
 Very large array and westerbrook observations in support of solar maximum mission experiment

Period	Obligations	
08/15/87-08/14/89	FY89: \$7,500	TOTAL: \$108,250
Prin. Invest.	NASA Tech. Officer	CASE Category
Kundu, M. R.	GSFC/Bullock, A. D.	19-Phys Sci, NEC
	GSFC/Gurman, J. B.	

NAG 5-1114 University of Maryland - College Park 3557
 Stimulated Raman scattering aerosol lidar flights

Period	Obligations	
12/15/88-12/14/89	FY89: \$55,258	TOTAL: \$55,258
Prin. Invest.	NASA Tech. Officer	CASE Category
Wilkerson, T. D.	GSFC/Sullivan, R. J.	31-Atmos Sci
Singh, U. N.	GSFC/Buften, J.	

NAG 5-1002 University of Maryland - College Park 3550
 Fleasibility study of a 64 channel multiplexer

Period	Obligations	
09/15/87-09/14/88	FY89:	TOTAL: \$8,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Zaki, K. A.	GSFC/Glenar, D. A.	45-Elec Engr
	GSFC/Kostiuk, T.	

NAG 5-1121 University of Maryland - College Park 3558
 Gaseous helium jet dispersion to atmosphere

Period	Obligations	
02/15/89-12/14/89	FY89: \$23,531	TOTAL: \$23,531
Prin. Invest.	NASA Tech. Officer	CASE Category
Khan, H. J.	GSFC/Figueroa, O.	49-Engr, NEC

NAG 5-1019 University of Maryland - College Park 3551
 Dynamic formulation efficient digital simulation telerobotic manipulation

Period	Obligations	
10/15/87-02/14/90	FY89: \$59,817	TOTAL: \$109,397
Prin. Invest.	NASA Tech. Officer	CASE Category
Chen, J.	GSFC/Celmer, J. J.	21-Mathematics

NAG 5-1129 University of Maryland - College Park 3559
 Cluster and coronal mass ejections

Period	Obligations	
04/15/89-04/14/90	FY89: \$25,336	TOTAL: \$25,336
Prin. Invest.	NASA Tech. Officer	CASE Category
Coplan, M. A.	GSFC/Ogilvie, K. W.	13-Physics

NAG 5-1039 University of Maryland - College Park 3552
 Cooperative research in infrared astronomy

Period	Obligations	
04/15/88-05/14/89	FY89: \$72,435	TOTAL: \$169,716
Prin. Invest.	NASA Tech. Officer	CASE Category
Trosco, J. D.	GSFC/Dwek, E.	11-Astronomy
Bell, R. A.		

NAG 5-1134 University of Maryland - College Park 3560
 Space sciences research

Period	Obligations	
07/01/89-06/30/90	FY89: \$89,426	TOTAL: \$89,426
Prin. Invest.	NASA Tech. Officer	CASE Category
Trasco, J. D.	GSFC/Kostiuk, T.	11-Astronomy
Bell, R. A.		

NAG 5-1047 University of Maryland - College Park 3553
 Sensory interaction supper control algorithm

Period	Obligations	
05/15/88-09/30/89	FY89:	TOTAL: \$30,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Baras, J. S.	GSFC/Vranish, J. M.	22-Computer Science
Salter, C.		

NAG 5-1149 University of Maryland - College Park 3561
 The design of an auroral and trapped radiation detector

Period	Obligations	
06/15/89-06/14/90	FY89: \$30,000	TOTAL: \$30,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Coplan, M. A.	GSFC/Hoffman, R. A.	13-Physics
Moore, J. H.		

NASA'S UNIVERSITY PROGRAM
MARYLAND (Continued)

NAG 5-1176 University of Maryland - College Park 3562
 Cooperative research in satellite based studies of photons and charged particles

Period	Obligations	
07/01/89-06/30/90	FY89: \$615,933	TOTAL: \$615,933
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Trasco, J. D.	GSFC/Jones, F. C.	11-Astronomy
Bell, R. A.		

NAG 5-1227 University of Maryland - College Park 3563
 High resolution image restoration of infrared astronomical satellite observations of Seyfert galaxies

Period	Obligations	
08/15/89-11/14/89	FY89: \$7,500	TOTAL: \$7,500
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Wilson, A. S.	GSFC/West, D.	11-Astronomy

NAG 5-1249 University of Maryland - College Park 3564
 Determination of the effective temperature of selected stars and supergiants

Period	Obligations	
09/15/89-12/14/89	FY89: \$7,400	TOTAL: \$7,400
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Bell, R. A.	GSFC/West, D.	11-Astronomy

NAG 5-1271 University of Maryland - College Park 3565
 Spatial access methods for the astrophysics databases based on spatial based techniques

Period	Obligations	
10/01/89-09/30/90	FY89: \$24,995	TOTAL: \$24,995
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Roussopoulos, N.	GSFC/Jacobs, B. E.	22-Computer Science

NAG 8-529 University of Maryland - College Park 3566
 Studies of radio jets and the narrow line regions of active galaxies with the AXAF

Period	Obligations	
05/01/85-01/12/90	FY89: \$26,000	TOTAL: \$115,700
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Wilson, A. S.	MSFC/Dailey, C. C.	11-Astronomy

NAGW 33 University of Maryland - College Park 3567
 A program to develop remote sensing excellence

Period	Obligations	
03/01/80-08/31/90	FY89:	TOTAL: \$1,125,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Ragan, R. M.	HQ-ET/Tuyahov, A. J.	39-Env Sci, NEC

NAGW 81 University of Maryland - College Park 3568
 A study of discontinuities and radiation processes in solar terrestrial plasmas

Period	Obligations	
06/01/80-10/31/89	FY89: \$75,000	TOTAL: \$2,147,500
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Papadopoulos, K.	HQ-ES/Mellott, M. M.	39-Env Sci, NEC
Wu, C. S.	HQ-ES/Perry, T. W.	

NAGW 101 University of Maryland - College Park 3569
 Thermal and suprathermal ion composition studies close to the Sun

Period	Obligations	
10/01/80-05/31/90	FY89: \$50,000	TOTAL: \$1,033,070
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Gloeckler, G.	HQ-ES/Bohlin, J. D.	13-Physics
	HQ-ES/Kane, S.	

NAGW 557 University of Maryland - College Park 3570
 United States and India cooperative research on monsoons

Period	Obligations	
12/19/83-09/30/89	FY89:	TOTAL: \$1,025,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Shukla, J.	HQ-EE/Schiffer, R. A.	31-Atmos Sci
	HQ-EE/Theon, J. S.	

NAGW 558 University of Maryland - College Park 3571
 U.S. India cooperative research on monsoons variability

Period	Obligations	
03/19/89-09/30/89	FY89: \$68,687	TOTAL: \$681,182
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Shukla, J.	HQ-EE/Kakar, R. K.	31-Atmos Sci
	HQ-EE/Theon, J. S.	

NAGW 637 University of Maryland - College Park 3572
 Analysis of Voyager infrared data on Titan

Period	Obligations	
07/15/84-10/31/89	FY89: \$35,614	TOTAL: \$218,798
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Khanna, R. K.	HQ-EL/Bergstralh, J. T.	31-Atmos Sci
	HQ-EL/Quaide, W. L.	

NAGW 824 University of Maryland - College Park 3573
 Planet crossing asteroids-interrelationships within the solar

Period	Obligations	
11/01/85-12/31/87	FY89:	TOTAL: \$50,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
McFadden, L.	HQ-EL/Brinton, H. C.	11-Astronomy
	HQ-EL/Rahe, J. H.	

NAGW 902 University of Maryland - College Park 3574
 Theoretical spectroscopy of comets

Period	Obligations	
06/01/86-12/31/89	FY89: \$55,000	TOTAL: \$192,500
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
A'hearn, M. F.	HQ-EL/Brinton, H. C.	11-Astronomy
	HQ-EL/Rahe, J. H.	

NAGW 971 University of Maryland - College Park 3575
 Plasma processes in the solar terrestrial environment

Period	Obligations	
09/15/86-09/30/89	FY89: \$100,000	TOTAL: \$639,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Wu, C. S.	HQ-ES/Mellott, M. M.	13-Physics
	GSFC/Curtis, S. A.	

NAGW 1003 University of Maryland - College Park 3576
 Monocrystalline silicon gradiometer for gravity experiments in space

Period	Obligations	
01/01/87-12/31/88	FY89:	TOTAL: \$150,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Richard, J. P.	HQ-E/Alexander, J. K.	13-Physics
	HQ-EP/Konkel, R. M.	

NAGW 1004 University of Maryland - College Park 3577
 Synthetic photometry for the Hubble space telescope

Period	Obligations	
12/01/86-09/30/89	FY89: \$39,000	TOTAL: \$113,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Bell, R. A.	HQ-EZ/Clayton, G. C.	11-Astronomy
	HQ-EZ/Bogges, N. W.	

NASA'S UNIVERSITY PROGRAM **MARYLAND (Continued)**

NAGW 1037 University of Maryland - College Park 3578
 Plasma processes in the comet Halley

Period	Obligations	
03/01/87-10/31/89	FY89: \$26,700	TOTAL: \$66,700
Prin. Invest.	NASA Tech. Officer	CASE Category
Papadopoulos, D.	HQ-EL/Bergstrahl, J. T.	31-Atmos Sci
	HQ-EL/Quaide, W. L.	

NAGW 1471 University of Maryland - College Park 3585
 Remote sensing of longwave heating from the Tirus operational sounder TOVS

Period	Obligations	
10/01/88-12/31/89	FY89: \$195,242	TOTAL: \$195,242
Prin. Invest.	NASA Tech. Officer	CASE Category
Ellingson, R. G.	HQ-EE/Huntress, W., Jr.	31-Atmos Sci
	HQ-EE/Tilford, S. G.	

NAGW 1142 University of Maryland - College Park 3579
 Analysis of the Boreal forest tunara ecotone: A test of aviris capabilities in the eastern Canadian subartic

Period	Obligations	
06/01/87-12/31/89	FY89:	TOTAL: \$63,818
Prin. Invest.	NASA Tech. Officer	CASE Category
Goward, S. N.	HQ-EE/Wickland, D. E.	39-Env Sci, NEC
Petzold, D. E.	HQ-EE/Ruzek, M.	

NAGW 1534 University of Maryland - College Park 3586
 Computer code for obtaining precipitating electron spectra by fitting calculated bremsstrahlung spectra to observed X ray data

Period	Obligations	
01/01/89-12/31/89	FY89: \$17,000	TOTAL: \$17,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Matthews, D. L.	HQ-ES/Mellott, M. M.	13-Physics
	HQ-ES/Perry, T. W.	

NAGW 1152 University of Maryland - College Park 3580
 Toward new theories in macroscale bioclimatology a study in satellite bioclimatology

Period	Obligations	
08/01/87-12/31/89	FY89: \$91,018	TOTAL: \$245,387
Prin. Invest.	NASA Tech. Officer	CASE Category
Goward, S. N.	HQ-EE/Wickland, D. E.	39-Env Sci, NEC
	HQ-EE/Ruzek, M.	

NAGW 1541 University of Maryland - College Park 3587
 Research in solar radio astronomy at short wavelengths

Period	Obligations	
11/01/88-10/31/89	FY89: \$85,000	TOTAL: \$85,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Kundu, M. R.	HQ-ES/Bohlin, J. D.	13-Physics
	HQ-ES/Kane, S.	

NAGW 1166 University of Maryland - College Park 3581
 Integration of space and in situ observations to study atmospheres ocean land processes

Period	Obligations	
09/01/87-08/31/89	FY89: \$274,902	TOTAL: \$484,751
Prin. Invest.	NASA Tech. Officer	CASE Category
Shukla, J.	HQ-EE/Kakar, R. K.	31-Atmos Sci
Kinter, J. L.	HQ-EE/Theon, J. S.	

NAGW 1614 University of Maryland - College Park 3588
 Cryogenic monocrystalline optical cavity for laser stabilization and precise time

Period	Obligations	
03/01/89-02/28/90	FY89: \$215,763	TOTAL: \$215,763
Prin. Invest.	NASA Tech. Officer	CASE Category
Richard, J. P.	HQ-E/Alexander, J. K.	45-Elec Engr
	HQ-E/Holland, D. A.	

NAGW 1269 University of Maryland - College Park 3582
 Atomosphere biosphere system

Period	Obligations	
11/01/87-10/31/89	FY89: \$159,557	TOTAL: \$319,556
Prin. Invest.	NASA Tech. Officer	CASE Category
Sellers, P.	HQ-EE/Asrar, G.	39-Env Sci, NEC
Shukla, J.	HQ-EE/Murphy, R.	

NAGW 1661 University of Maryland - College Park 3589
 Plasma instabilities in the magnetosphere and the solar wind and their consequences

Period	Obligations	
02/01/89-01/31/90	FY89: \$80,000	TOTAL: \$80,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Drake, J. F.	HQ-ES/Mellott, M.	31-Atmos Sci

NAGW 1326 University of Maryland - College Park 3583
 Absolute absorption cross sections in the 1600 2800 a region

Period	Obligations	
03/01/88-02/18/90	FY89:	TOTAL: \$40,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Ginter, M. L.	HQ-EE/Tilford, S. G.	19-Phys Sci, NEC
	HQ-EE/Estes, J. E.	

NAGW 1813 University of Maryland - College Park 3590
 Infrared auroral processes in Jupiter

Period	Obligations	
07/01/89-06/30/90	FY89: \$31,000	TOTAL: \$31,000
Prin. Invest.	NASA Tech. Officer	CASE Category
A'hearn, M. J.	HQ-EL/Bergstrahl, J. T.	32-Geological Sci

NAGW 1346 University of Maryland - College Park 3584
 Three dimensional considerations of solar loop equilibria and their stability

Period	Obligations	
06/01/88-05/31/90	FY89: \$75,000	TOTAL: \$135,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Finn, J. M.	HQ-ES/Bohlin, J. D.	13-Physics
Hasam, A. B.	HQ-ES/Kane, S.	

NAS 3-25370 University of Maryland - College Park 3591
 Critical fluid light scattering experiment

Period	Obligations	
12/22/88-04/15/93	FY89: \$3,000,000	TOTAL: \$3,000,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Gammon, R. W.	LERC/Lauver, R. W.	13-Physics

NAS 5-26856 University of Maryland - College Park 3592
 Definition studies for the solar wind and superthermal ion composition studies

Period	Obligations	
05/03/82-11/30/89	FY89:	TOTAL: \$1,144,783
Prin. Invest.	NASA Tech. Officer	CASE Category
Gloeckler, G.	GSFC/O'brien, J. J.	13-Physics

NASA'S UNIVERSITY PROGRAM **MARYLAND (Continued)**

NAS 5-29163 University of Maryland - College Park 3593
Cooperative visitors program
Period *Obligations*
05/21/85-07/27/91 FY89: \$105,456 TOTAL: \$533,998
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Baer, F. GSFC/Kreins, E. R. 31-Atmos Sci

NAS 5-30108 University of Maryland - College Park 3594
Support for the summer institute for atmospheric studies
Period *Obligations*
05/07/87-07/07/88 FY89: TOTAL: \$89,793
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Baer, F. GSFC/Kreins, E. 31-Atmos Sci

NAS 5-30370 University of Maryland - College Park 3595
Solar wind and superthermal ion composition instrument for the solar terrestrial physics wind mission
Period *Obligations*
03/10/89-09/09/94 FY89: \$1,300,000 TOTAL: \$1,300,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Gloeckler, S. GSFC/Wainscott, F. 41-Aero Engr

NAS 5-30385 University of Maryland - College Park 3596
Investigation definition phase contract for the charge element and isotope analysis system
Period *Obligations*
10/20/88-09/30/89 FY89: \$150,000 TOTAL: \$150,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Gloeckler, G. GSFC/Stich, K. 31-Atmos Sci

NAS 5-30704 University of Maryland - College Park 3597
Development of the solar, anomalous, and magnetospheric particle Explorer (SAMPEX)
Period *Obligations*
08/02/89-06/30/92 FY89: \$362,000 TOTAL: \$362,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Mason, G. M. GSFC/Carson, D. E. 13-Physics

NAS 8-36165 University of Maryland - College Park 3598
Development of a three axis superconducting gravity gradiometer for spacelaunch gravity survey
Period *Obligations*
06/28/85-06/27/89 FY89: \$135,000 TOTAL: \$1,010,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Paik, H. J. MSFC/Morgan, S. H. 13-Physics
MSFC/Strauss, E. M.

NAS 8-38137 University of Maryland - College Park 3599
Development of a three-axis superconducting gravity gradiometer for spaceborne gravity survey
Period *Obligations*
06/29/89-06/28/92 FY89: \$467,000 TOTAL: \$467,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Paik, H. J. MSFC/Morgan Jr., S. H. 42-Astro Engr
Moody, M. V.

NASW 4193 University of Maryland - College Park 3600
Writing a history of GSFC
Period *Obligations*
09/30/86-12/31/89 FY89: \$8,625 TOTAL: \$149,686
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Friedel, R. D. HQ-LB/Fries, S. D. 73-History
Thackray, A.
Brush, S.

NASW 4221 University of Maryland - College Park 3601
Composition requirements of magnetospheric and cometary atoms and molecular ions and neutrals
Period *Obligations*
02/01/87-03/31/89 FY89: TOTAL: \$200,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hamilton, D. C. HQ-EL/Evans, L. G. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NCA 2-309 University of Maryland - College Park 3602
Rotorcraft flight control system design methodologies
Period *Obligations*
04/01/88-03/31/90 FY89: \$30,000 TOTAL: \$60,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Fan, M. ARC/Tischler, M. 29-Math/Computer, NEC
Tits, A.
Barlow, J.

NCA 2-310 University of Maryland - College Park 3603
Simulation modelling for combat rotorcraft flight control system design
Period *Obligations*
04/01/88-03/31/90 FY89: \$30,000 TOTAL: \$60,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Celi, R. ARC/Tischler, M. B. 29-Math/Computer, NEC
Barlow, J. B.

NCA 2-435 University of Maryland - College Park 3604
Asymptotic analysis of finite difference methods by the nonlinear dynamic approach
Period *Obligations*
07/01/89-06/30/90 FY89: \$10,000 TOTAL: \$10,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Grebogi, C. ARC/Yee, H. C. 29-Math/Computer, NEC
Yorke, J.

NCA 5-110 University of Maryland - College Park 3605
Instructional use of pilot climate data system
Period *Obligations*
07/01/87-02/28/90 FY89: \$20,000 TOTAL: \$78,017
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Vernekar, A. D. GSFC/Brown, R. 29-Math/Computer, NEC

NCC 1-25 University of Maryland - College Park 3606
Investigation of near-infrared differential absorption lidar (DIAL) techniques for airborne/spaceborne water vapor profiling
Period *Obligations*
08/01/79-02/28/90 FY89: \$90,000 TOTAL: \$493,297
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wilkerson, T. D. LARC/Browell, E. V. 31-Atmos Sci
Singh, H. LARC/Carter, A. F.

NCC 2-474 University of Maryland - College Park 3607
Structuring and searching online knowledge the information expert system
Period *Obligations*
02/01/87-09/30/88 FY89: TOTAL: \$50,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Shneiderman, B. ARC/Lum, H. 22-Computer Science

NCC 2-519 University of Maryland - College Park 3608
Architectural studies of autonomous systems
Period *Obligations*
10/01/87-03/31/89 FY89: TOTAL: \$50,341
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Agrawala, A. K. ARC/Lum, H. 22-Computer Science
Larsen, R. L.

**NASA'S UNIVERSITY PROGRAM
MARYLAND (Continued)**

NCC 2-560 University of Maryland - College Park 3609
NASA research program in parallel processing

Period	Obligations	
09/01/88-12/31/89	FY89:	TOTAL: \$534,989
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Davis, L. S.	ARC/Lum, H.	22-Computer Science
Rosenfeld, A.	ARC/Mckellar, D.	

NCC 5-26 University of Maryland - College Park 3610
Analysis of terrestrial conditions and dynamics

Period	Obligations	
12/01/82-01/31/90	FY89: \$200,766	TOTAL: \$895,976
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Goward, S. N.	GSFC/Middleton, E. M.	31-Atmos Sci
Walshall, C.	GSFC/Tucker, C. J.	

NCC 5-35 University of Maryland - College Park 3611
Atmospheric physics and spacecraft applications studies

Period	Obligations	
11/15/85-04/30/90	FY89: \$614,600	TOTAL: \$2,026,495
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Greenwood, S. W.	GSFC/Hoegy, W. R.	19-Phys Sci, NEC
	GSFC/Herrero, F.	

NCC 5-39 University of Maryland - College Park 3612
Research relative to atmospheric sciences's summer institute

Period	Obligations	
07/15/88-11/30/89	FY89: \$27,325	TOTAL: \$73,023
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Baer, F.	GSFC/Kreins, E. R.	31-Atmos Sci

NGL 21-002-005 University of Maryland - College Park 3613
Theoretical research on dynamics of astrophysical plasmas including studies of structure of plasma shock waves in solar corona and their possible radio emission

Period	Obligations	
02/01/62-05/31/89	FY89: \$5,000	TOTAL: \$2,090,493
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Wu, C. S.	HQ-ES/Mellott, M. M.	19-Phys Sci, NEC
	HQ-EE/Eastman, T. E.	

NGL 21-002-033 University of Maryland - College Park 3614
Theoretical and experimental studies in space sciences, including consideration of rocket probe and satellites techniques

Period	Obligations	
06/02/64-06/30/89	FY89: \$44,616	TOTAL: \$4,855,444
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Trasco, J.	GSFC/Kostiuk, T.	31-Atmos Sci
Bell, R.		

NGR 21-002-066 University of Maryland - College Park 3615
A study of primary cosmic ray electrons, utilizing balloon-borne experiments

Period	Obligations	
11/19/65-03/31/90	FY89: \$30,000	TOTAL: \$1,095,241
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Earl, J. A.	HQ-ES/Mellott, M. M.	11-Astronomy
	HQ-ES/Perry, T. W.	

NGR 21-002-199 University of Maryland - College Park 3616
Research in solar radio astronomy at short wavelengths

Period	Obligations	
04/11/69-10/31/88	FY89:	TOTAL: \$976,656
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Kundu, M. R.	HQ-EZ/Ahluwalia, H. S.	13-Physics

NGR 21-002-224 University of Maryland - College Park 3617
Research on the measurement of the charge and isotopic composition on the primary cosmic rays

Period	Obligations	
07/31/69-10/31/89	FY89: \$100,000	TOTAL: \$1,131,300
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Mason, G.	HQ-ES/Mellott, M. M.	11-Astronomy
	HQ-ES/Perry, T. W.	

NGR 21-002-316 University of Maryland - College Park 3618
Research program in charged particle detector technology

Period	Obligations	
07/01/71-09/30/89	FY89: \$163,550	TOTAL: \$9,030,217
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Gloeckler, G.	GSFC/Jones, F.	19-Phys Sci, NEC
Trasco, J. D.	GSFC/Hoegy, W. R.	
Galvin, A. B.		

NGR 21-002-317 University of Maryland - College Park 3619
Chemical studies of the origin of life

Period	Obligations	
08/18/71-09/30/89	FY89: \$154,000	TOTAL: \$2,111,248
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Ponnamperuma, C. A.	HQ-EB/Fogleman, S. W.	12-Chemistry
	HQ-EB/Rummel, J. D.	

NGT 00-050-055 University of Maryland - College Park 3620
NASA graduate student researchers program

Period	Obligations	
06/01/86-05/31/89	FY89:	TOTAL: \$52,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Ramaty, R.	HQ-LE/Owens, F. C.	13-Physics

NGT 00-050-056 University of Maryland - College Park 3621
NASA graduate student researchers program

Period	Obligations	
06/01/86-05/31/90	FY89: \$18,000	TOTAL: \$68,300
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Davis, C. C.	HQ-LE/Owens, F. C.	13-Physics

NGT 00-050-148 University of Maryland - College Park 3622
NASA graduate student researchers program

Period	Obligations	
06/01/87-05/31/90	FY89: \$18,000	TOTAL: \$53,800
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Khanna, R. K.	HQ-XE/Owens, F. C.	12-Chemistry

NGT 00-050-150 University of Maryland - College Park 3623
NASA graduate student researchers program

Period	Obligations	
06/01/87-05/31/90	FY89: \$17,800	TOTAL: \$53,800
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Goodman, J.	HQ-XE/Owens, F. C.	13-Physics

NGT 00-050-239 University of Maryland - College Park 3624
NASA graduate student researchers program

Period	Obligations	
09/01/87-08/31/89	FY89:	TOTAL: \$36,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
A'hearn, M. F.	HQ-XE/Owens, F. C.	11-Astronomy

NASA'S UNIVERSITY PROGRAM **MARYLAND (Continued)**

NGT 00-050-297 University of Maryland - College Park 3625
 NASA graduate student researchers program
Period *Obligations*
 08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Goward, S. N. HQ-XE/Owens, F. C. 39-Env Sci, NEC

NGT 00-050-328 University of Maryland - College Park 3626
 NASA graduate student researchers program
Period *Obligations*
 08/01/88-07/31/90 FY89: TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Ramaty, R. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-424 University of Maryland - College Park 3627
 NASA graduate student researchers program
Period *Obligations*
 08/15/89-08/14/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Baras, J. S. HQ-XE/Owens, F. C. 49-Engr, NEC

NGT 00-070-090 University of Maryland - College Park 3628
 Graduate student researchers underrepresented minority focus program
Period *Obligations*
 06/01/88-05/31/90 FY89: \$13,000 TOTAL: \$31,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Winkelmann, A. E. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 21-002-254 University of Maryland - College Park 3629
 Summer faculty fellowship program in research for 24 faculty members
Period *Obligations*
 12/23/69-03/31/90 FY89: \$315,281 TOTAL: \$2,153,994
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Boroson, H. R. HQ-XE/McGee, A. S. 49-Engr, NEC
 HQ-XE/Schwartz, E. T.

NGT 21-002-819 University of Maryland - College Park 3630
 NASA graduate student researchers program
Period *Obligations*
 06/01/84-08/31/88 FY89: TOTAL: \$59,690
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Kerr, F. HQ-XE/Owens, F. C. 11-Astronomy

NGT 21-002-820 University of Maryland - College Park 3631
 NASA graduate student researchers program
Period *Obligations*
 06/01/85-05/31/88 FY89: TOTAL: \$49,518
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Ipavich, F. M. HQ-LE/Owens, F. C. 13-Physics

NGT 21-002-821 University of Maryland - College Park 3632
 NASA graduate student researchers program
Period *Obligations*
 04/01/85-03/31/88 FY89: TOTAL: \$41,050
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Boldt, E. HQ-LE/Owens, F. C. 13-Physics

NGT 21-002-823 University of Maryland - College Park 3633
 NASA graduate student researchers program
Period *Obligations*
 06/01/85-05/31/88 FY89: TOTAL: \$47,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Donaldson, B. HQ-LE/Owens, F. C. 41-Aero Engr

NSG 5047 University of Maryland - College Park 3634
 Study of the geochemistry and dispersal of radionuclides and trace metals in Chesapeake Bay sediments
Period *Obligations*
 02/01/75-04/30/89 FY89: TOTAL: \$8,509
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Sommer, S. E. GSFC/Cressy, P. J. 32-Geological Sci
 Adler, I. GSFC/Trombka, J. I.

NSG 5123 University of Maryland - College Park 3635
 Evaluation of software engineering disciplines
Period *Obligations*
 08/01/76-04/30/90 FY89: \$202,453 TOTAL: \$1,409,452
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Basili, V. R. GSFC/McGarry, F. E. 22-Computer Science
 Rombach, D. H.
 Zerkowitz, M. V.

NSG 5172 University of Maryland - College Park 3636
 Raman spectroscopy of cosmic ices and planetary atmospheres
Period *Obligations*
 04/01/77-05/14/90 FY89: \$146,684 TOTAL: \$536,999
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Khanna, R. K. GSFC/Donn, B. D. 12-Chemistry
 GSFC/Nuth, J. A.

NSG 5423 University of Maryland - College Park 3637
 Geologic modeling of the Patapsco watershed Maryland
Period *Obligations*
 10/15/79-09/14/89 FY89: TOTAL: \$630,580
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Chang, L. L. GSFC/Bell, R. 32-Geological Sci
 GSFC/Masuoka, E. J.

NSG 7322 University of Maryland - College Park 3638
 Research on comets
Period *Obligations*
 03/01/77-11/30/89 FY89: \$100,000 TOTAL: \$823,709
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 A'hearn, M. F. HQ-EL/Brinton, H. C. 11-Astronomy
 HQ-EL/Rahe, J. H.

NCA 5-99 University of Maryland - Eastern Shore 3639
 Engineering and pre-engineering activities
Period *Obligations*
 06/16/82-05/31/90 FY89: \$40,000 TOTAL: \$364,900
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Muller, R. E. GSFC/Menchan, D. 45-Elec Engr
 GSFC/Chapman, J. W.

MASSACHUSETTS

NAG 1-955 Boston College 3640
 Enhancement of solid state infrared laser output via interionic energy
Period *Obligations*
 02/01/89-11/30/89 FY89: \$25,000 TOTAL: \$25,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Dibartolo, B. LARC/Brockman, P. 13-Physics

**NASA'S UNIVERSITY PROGRAM
MASSACHUSETTS (Continued)**

NAG 5-1193	Boston College	3641	NAGW 1032	Boston University	3649
Infrared emission associated with selected clouds			Superconducting magnet instrument for light isotopes		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
08/01/89-01/31/90	FY89: \$17,500	TOTAL: \$17,500	12/01/86-11/30/89	FY89: \$125,000	TOTAL: \$332,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Bania, T. M.	GSFC/West, D.	11-Astronomy	Beatty, J. J.	HQ-ES/Mellott, M. M.	13-Physics
				HQ-ES/Jones, W. V.	
NAG 1-934	Boston University	3642	NAGW 1474	Boston University	3650
Critical evaluation and assessment of surface panel codes			Geometric optical discrete element scene modeling		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
12/01/88-02/28/90	FY89: \$49,750	TOTAL: \$49,750	09/01/88-12/31/89	FY89: \$107,500	TOTAL: \$107,500
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Morino, L.	LARC/Yates, E. C.	41-Aero Engr	Strahler, A.	HQ-EE/Asrar, G.	19-Phys Sci, NEC
Piva, R.				HQ-EE/Ruzek, M.	
NAG 5-490	Boston University	3643	NAGW 1518	Boston University	3651
Optical diagnostics of selected chemical release experiments			Solar and solar wind variability prior to the period of in siter space observations as reflected in auroral records		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
02/01/85-09/30/89	FY89:	TOTAL: \$83,500	02/20/89-02/19/90	FY89: \$20,762	TOTAL: \$20,762
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Mendillo, M.	GSFC/Curtis, S. A.	13-Physics	Silverman, S. M.	LERC/Coltrin, R. E.	13-Physics
NAG 5-640	Boston University	3644	NAGW 1608	Boston University	3652
Active experiments in the near Earth space environment			Variability of the high energy continuum emission in active galactic nuclei and high luminosity X ray binary systems		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
01/01/87-12/31/89	FY89: \$140,000	TOTAL: \$380,000	01/01/89-12/31/89	FY89: \$157,409	TOTAL: \$157,409
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Mendillo, M.	GSFC/Early, L. J.	13-Physics	Marscher, A. P.	HQ-EZ/Kaluzienski, L. J.	11-Astronomy
	GSFC/Pless, R. H.			HQ-EZ/Bunner, A. N.	
NAG 5-1013	Boston University	3645	NAGW 1627	Boston University	3653
High resolution drift chambers under the astromag study program			Magnetospheric substorms and tail dynamics		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
07/15/88-02/14/90	FY89: \$51,750	TOTAL: \$72,490	03/01/89-02/28/90	FY89: \$50,000	TOTAL: \$50,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Beatty, J. J.	GSFC/Ormes, J. F.	13-Physics	Hughes, W. J.	HQ-ES/Mellott, M. M.	13-Physics
				HQ-ES/Perry, T. W.	
NAG 5-1160	Boston University	3646	NAGW 1629	Boston University	3654
Extended dust structures in massive cloud cores and physical conditions of Bok globules: A correlative study of far-infrared dust			Active experiments new approaches to analysis and simulation of space plasmas		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
08/01/89-07/31/90	FY89: \$56,092	TOTAL: \$56,092	03/01/89-02/28/90	FY89: \$85,000	TOTAL: \$85,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Clemens, D. P.	GSFC/West, D.	11-Astronomy	Mendillo, M.	HQ-ES/Mellott, M. M.	13-Physics
				HQ-ES/Perry, T. W.	
NAG 8-671	Boston University	3647	NAS 8-36324	Boston University	3655
The relationship between X ray flux and VLBI radio core brightness under SADAP			A study entitled releases to induce plasma instabilities at the equator		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
08/01/87-07/31/88	FY89:	TOTAL: \$29,000	04/16/85-09/30/92	FY89: \$633,000	TOTAL: \$5,841
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Marscher, A. P.	MSFC/Harper, B.	11-Astronomy	Mendillo, M.	MSFC/Reasoner, D. L.	31-Atmos Sci
NAG 9-168	Boston University	3648	NASW 4468	Boston University	3656
Meteoritic basalts the nakhlites their parental magmas cooling rates and equivalents on Earth			Report on pneumatic structures for lunar and Martian habitats		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
07/01/86-07/01/89	FY89:	TOTAL: \$73,800	09/28/89-03/28/90	FY89: \$29,509	TOTAL: \$29,509
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Treiman, A. H.	JSC/Browne, I. D.	32-Geological Sci	Nagem, R. J.	HQ-Z/Bekey, I.	49-Engr, NEC
			Sandri, G. V.		

**NASA'S UNIVERSITY PROGRAM
MASSACHUSETTS (Continued)**

NCA 2-321 Boston University 3657
Far infrared spectroscopy of star formation regions
Period Obligations
06/01/88-05/31/90 FY89: \$12,297 TOTAL: \$23,787
Prin. Invest. NASA Tech. Officer CASE Category
Pohorille, A. ARC/Haas, M. R. 11-Astronomy
ARC/Hollenbach, D. J.

NGT 00-050-314 Boston University 3658
NASA graduate student researchers program
Period Obligations
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Marcher, A. P. HQ-XE/Owens, F. C. 11-Astronomy

NGT 00-050-497 Boston University 3659
NASA graduate student researchers program
Period Obligations
08/01/89-07/31/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Grossberg, S. HQ-XE/Owens, F. C. 51-Biological Sci

NAG 9-293 Brandeis University 3660
Otolith reflex response
Period Obligations
04/01/88-10/01/89 FY89: TOTAL: \$50,000
Prin. Invest. NASA Tech. Officer CASE Category
Johnson, W. H. JSC/Kutyna, F. A. 51-Biological Sci

NAG 9-295 Brandeis University 3661
Preventative countermeasures space adapt
Period Obligations
03/01/88-05/01/90 FY89: \$325,700 TOTAL: \$725,700
Prin. Invest. NASA Tech. Officer CASE Category
Lackner, J. R. JSC/Kutyna, F. A. 56-Medical Sciences

NAS 9-15147 Brandeis University 3662
Vestibular selection criteria development
Period Obligations
09/01/76-06/01/88 FY89: TOTAL: \$2,531,066
Prin. Invest. NASA Tech. Officer CASE Category
Lackner, J. B. JSC/Kutyna, F. 59-Life Sci, NEC

NGT 00-050-068 Brandeis University 3663
NASA graduate student researchers program
Period Obligations
07/01/86-06/30/89 FY89: TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Waltz, D. HQ-LE/Owens, F. C. 45-Elec Engr

NGT 00-050-306 Brandeis University 3664
NASA graduate student researchers program
Period Obligations
08/01/88-07/31/90 FY89: \$15,000 TOTAL: \$28,000
Prin. Invest. NASA Tech. Officer CASE Category
Lackner, J. R. HQ-XE/Owens, F. C. 69-Psych, NEC

NGT 00-050-308 Brandeis University 3665
NASA graduate student researchers program
Period Obligations
08/01/88-07/31/90 FY89: \$16,175 TOTAL: \$32,165
Prin. Invest. NASA Tech. Officer CASE Category
Wardle, J. F. HQ-XE/Owens, F. C. 13-Physics

NAG 1-55 Harvard University 3666
Biogenic trace gas emissions and atmospheric chemistry in tropical forests atmospheric gases
Period Obligations
04/03/80-12/31/89 FY89: \$341,150 TOTAL: \$2,406,469
Prin. Invest. NASA Tech. Officer CASE Category
McElroy, M. B. LARC/Fishman, J. 31-Atmos Sci
Wofsy, S. C. LARC/Hoell, J. M.

NAG 2-451 Harvard University 3667
Measurement of blood flows pressures and cardiac dimensions in Rhesus monkeys
Period Obligations
04/01/87-11/30/89 FY89: \$230,639 TOTAL: \$513,790
Prin. Invest. NASA Tech. Officer CASE Category
Vatner, S. F. ARC/Ballard, R. W. 51-Biological Sci
Knight, D. R. ARC/Winget, C. M.
Patrick, T. A.

NAG 2-526 Harvard University 3668
1988 arctic survey diurnal study sunrise and sunset and peak altitude 22 km flights for the in situ detection of c10 and br0 from the NASA er 2 aircraft
Period Obligations
02/01/88-12/31/88 FY89: TOTAL: \$62,699
Prin. Invest. NASA Tech. Officer CASE Category
Anderson, J. G. ARC/Condon, E. P. 31-Atmos Sci

NAG 5-538 Harvard University 3669
Very long baseline interferometry determination and interpretation of the relative motions within a network of sites in North America and Europe
Period Obligations
05/01/85-03/31/90 FY89: \$144,877 TOTAL: \$641,154
Prin. Invest. NASA Tech. Officer CASE Category
Shapiro, I. I. GSFC/Frey, H. V. 32-Geological Sci

NAG 5-645 Harvard University 3670
The atmosphere of supernova 1987a in the large Magellanic cloud
Period Obligations
09/01/87-07/31/89 FY89: TOTAL: \$53,071
Prin. Invest. NASA Tech. Officer CASE Category
Kirshner, R. P. GSFC/Early, L. J. 11-Astronomy
GSFC/Pless, R. H.

NAG 5-719 Harvard University 3671
Chemistry of stratospheric and tropospheric gases
Period Obligations
10/15/85-02/14/90 FY89: \$154,000 TOTAL: \$581,000
Prin. Invest. NASA Tech. Officer CASE Category
McElroy, M. B. GSFC/Prather, M. 31-Atmos Sci
Wofsy, S. C.

NAG 5-840 Harvard University 3672
Continental and lithospheric deformation
Period Obligations
09/01/86-07/31/90 FY89: \$102,195 TOTAL: \$359,888
Prin. Invest. NASA Tech. Officer CASE Category
O'connell, R. J. GSFC/Frey, H. V. 32-Geological Sci
Englend, P. C.

NAG 5-841 Harvard University 3673
Supernova spectroscopy research
Period Obligations
09/15/86-03/14/90 FY89: \$159,812 TOTAL: \$203,564
Prin. Invest. NASA Tech. Officer CASE Category
Kirshner, R. P. GSFC/West, D. K. 11-Astronomy

**NASA'S UNIVERSITY PROGRAM
MASSACHUSETTS (Continued)**

NAG 5-918	Harvard University	3674	Geomagnetic field analysis simultaneous stochastic inversion for the main field and secular variation
<i>Period</i>	<i>Obligations</i>		
06/01/87-10/31/89	FY89:	TOTAL: \$118,775	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Bloxham, J.	GSFC/Welker, J. E.	32-Geological Sci	
NAG 5-1128	Harvard University	3675	Group research in global geodynamics
<i>Period</i>	<i>Obligations</i>		
06/15/89-06/14/90	FY89: \$75,000	TOTAL: \$75,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Woodhouse, J. H.	GSFC/Welker, J. E.	32-Geological Sci	
NAG 8-603	Harvard University	3676	X ray and optical images of LMC supernova remnants
<i>Period</i>	<i>Obligations</i>		
10/01/86-09/30/88	FY89:	TOTAL: \$22,614	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Kirshner, R. P.	MSFC/Harper, B. A.	11-Astronomy	
NAG 8-655	Harvard University	3677	Temporal and spectral signatures of black hole accretion
<i>Period</i>	<i>Obligations</i>		
07/01/87-12/31/88	FY89:	TOTAL: \$14,876	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Grindlay, J. E.	MSFC/Havrisik, D.	11-Astronomy	
NAG 9-17	Harvard University	3678	Angiotensin antagonists and volume homeostasis: Studies in man, intact animals and isolated tissues
<i>Period</i>	<i>Obligations</i>		
03/06/81-12/01/89	FY89:	TOTAL: \$283,500	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hollenberg, N. K.	JSC/Cintrón, N. M.	56-Medical Sciences	
NAG 9-264	Harvard University	3679	Role of kidney in fluid and electrolyte response to cephalad volume shift
<i>Period</i>	<i>Obligations</i>		
01/01/88-01/01/89	FY89:	TOTAL: \$60,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Ede, M. C.	JSC/Cintrón, N. M.	56-Medical Sciences	
Churchill, D.			
NAGW 359	Harvard University	3680	Chemistry of stratospheres and tropospheres gases
<i>Period</i>	<i>Obligations</i>		
07/01/82-12/31/89	FY89:	TOTAL: \$660,309	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
McElroy, M. B.	HQ-EE/Jackman, C. H.	31-Atmos Sci	
Prather, M.	HQ-EE/Demore, W. B.		
NAGW 417	Harvard University	3681	Theoretical studies of the composition and evolution of planetary atmospheres
<i>Period</i>	<i>Obligations</i>		
01/01/83-03/31/88	FY89:	TOTAL: \$321,771	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
McElroy, G. B.	HQ-EL/Fox, K.	31-Atmos Sci	
	HQ-EL/Quaide, W. L.		
NAGW 599	Harvard University	3682	Paleosols as indicators of atmospheric evolution
<i>Period</i>	<i>Obligations</i>		
04/01/84-09/30/89	FY89: \$80,003	TOTAL: \$310,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Holland, A. D.	HQ-EB/Rummel, J. D.	32-Geological Sci	
	HQ-EB/Averner, M.		
NAGW 624	Harvard University	3683	Development of an energetic X ray imaging experiment (EXITE) and associated balloon gondola system
<i>Period</i>	<i>Obligations</i>		
04/01/84-03/31/90	FY89: \$289,058	TOTAL: \$1,469,023	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Grindlay, J.	HQ-EZ/Kaluzienski, L. J.	11-Astronomy	
	HQ-EZ/Bunner, A. N.		
NAGW 893	Harvard University	3684	Continued research
<i>Period</i>	<i>Obligations</i>		
05/15/86-11/30/89	FY89: \$56,635	TOTAL: \$202,589	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Knoll, A. H.	HQ-EB/Rummel, J. D.	32-Geological Sci	
	HQ-EB/Averner, M.		
NAGW 1230	Harvard University	3685	Stratospheric chemistry
<i>Period</i>	<i>Obligations</i>		
12/01/87-11/30/89	FY89: \$253,683	TOTAL: \$438,703	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Wofsy, S. C.	HQ-EE/McPeters, R. D.	31-Atmos Sci	
	HQ-EE/Prather, M. J.		
NAGW 1337	Harvard University	3686	High angular resolution observation of SN 1987a
<i>Period</i>	<i>Obligations</i>		
07/01/88-06/30/89	FY89:	TOTAL: \$25,023	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Papaliolos, C.	HQ-EZ/Stachnik, R. V.	11-Astronomy	
NAGW 1384	Harvard University	3687	Planetary atmospheres
<i>Period</i>	<i>Obligations</i>		
10/01/88-09/30/89	FY89: \$15,514	TOTAL: \$25,514	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Goody, R. M.	HQ-EL/Fox, K.	31-Atmos Sci	
	HQ-EL/Quaide, W. L.		
NAGW 1400	Harvard University	3688	Low temperature absorption coefficients for molecules in planetary atmosphere
<i>Period</i>	<i>Obligations</i>		
07/01/88-11/30/89	FY89: \$17,736	TOTAL: \$60,106	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Parkinson, W. H.	HQ-EL/Bergstrahl, J. T.	31-Atmos Sci	
	HQ-EL/Quaide, W. L.		
NAGW 1464	Harvard University	3689	In situ detection methods for balloon and aircraft applications
<i>Period</i>	<i>Obligations</i>		
08/01/88-09/30/89	FY89: \$325,778	TOTAL: \$325,778	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Anderson, J. G.	HQ-EE/Kurylo, M. J.	31-Atmos Sci	
	HQ-EE/Watson, R. T.		

**NASA'S UNIVERSITY PROGRAM
MASSACHUSETTS (Continued)**

NAGW 1596 Harvard University 3690
Absolute transition probabilities of lines in the spectra of astrophysical atoms, molecules and ions
Period Obligations
02/15/89-12/14/89 FY89: \$62,000 TOTAL: \$62,000
Prin. Invest. NASA Tech. Officer CASE Category
Parkinson, W. H. HQ-EZ/Clayton, G. C. 31-Atmos Sci

NAGW 1598 Harvard University 3691
Theoretical research in planetary physics
Period Obligations
03/01/89-02/28/90 FY89: \$59,270 TOTAL: \$59,270
Prin. Invest. NASA Tech. Officer CASE Category
Cameron, A. G. HQ-EL/Boyce, J. M. 32-Geological Sci

NAGW 1687 Harvard University 3692
Laboratory studies in ultraviolet solar physics
Period Obligations
10/01/88-09/30/89 FY89: \$155,000 TOTAL: \$155,000
Prin. Invest. NASA Tech. Officer CASE Category
Parkinson, W. H. HQ-ES/Bohlin, J. D. 13-Physics
HQ-ES/Kane, S.

NAGW 1721 Harvard University 3693
Exite IPC observations of SN 1987a
Period Obligations
03/01/89-02/28/90 FY89: \$136,178 TOTAL: \$136,178
Prin. Invest. NASA Tech. Officer CASE Category
Grindlay, J. E. HQ-EZ/Kaluzienski, L. J. 11-Astronomy
HQ-EZ/Bunner, A. N.

NAGW 1789 Harvard University 3694
Atmosphere of supernova 1987a in the large magellanic cloud
Period Obligations
06/01/89-05/30/90 FY89: \$80,688 TOTAL: \$80,688
Prin. Invest. NASA Tech. Officer CASE Category
Kirschner, R. HQ-EZ/Clayton, G. C. 31-Atmos Sci

NAS 2-10547 Harvard University 3695
Fluid and electrolyte homeostasis during spaceflight: Elucidation of mechanisms in a primate
Period Obligations
01/17/80-03/31/88 FY89: TOTAL: \$1,663,717
Prin. Invest. NASA Tech. Officer CASE Category
Moore-ede, M. C. ARC/Leon, H. 51-Biological Sci
ARC/Connolly, J.

NASW 3960 Harvard University 3696
Field measurement program to examine in situ, the photochemistry of H, OH, HO, H₂O, C₁, C₁O, NO, O,
Period Obligations
04/01/84-03/31/90 FY89: \$1,252,839 TOTAL: \$9,011,929
Prin. Invest. NASA Tech. Officer CASE Category
Anderson, J. G. HQ-EE/Margitan, J. J. 31-Atmos Sci
HQ-EE/Watson, R. T.

NCC 2-457 Harvard University 3697
To produce guidelines for team performance and organizational structure in aerospace environments
Period Obligations
04/01/88-07/31/89 FY89: \$135,000 TOTAL: \$270,000
Prin. Invest. NASA Tech. Officer CASE Category
Hackman, J. R. ARC/Foushee, H. C. 62-Social Aspects
Ginnett, R. C. ARC/Kanki, B. G.

NCC 2-623 Harvard University 3698
Crew behavior and performance in space analog environments: A mindful analysis
Period Obligations
06/01/89-05/31/90 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. NASA Tech. Officer CASE Category
Langer, E. J. ARC/Chidester, T. R. 62-Social Aspects
ARC/Kanki, B. G.

NCC 2-628 Harvard University 3699
Processes involved in microbial biofilm formation in water reclamation systems for the orbiting space station
Period Obligations
03/01/89-12/31/89 FY89: \$120,000 TOTAL: \$120,000
Prin. Invest. NASA Tech. Officer CASE Category
Mitchell, R. ARC/MacElroy, R. D. 51-Biological Sci

NGL 22-007-006 Harvard University 3700
Theoretical and experimental studies on ultraviolet solar physics
Period Obligations
07/10/63-12/31/88 FY89: TOTAL: \$6,561,398
Prin. Invest. NASA Tech. Officer CASE Category
Parkinson, W. H. HQ-ES/Ahluwalia, H. S. 13-Physics
HQ-EZ/Bohlin, J. D.

NGL 22-007-228 Harvard University 3701
Theoretical investigation of multiphase in Jupiter interior and possible relationship to behavior of outer atmospheric layers
Period Obligations
12/15/71-09/30/89 FY89: TOTAL: \$3,829,999
Prin. Invest. NASA Tech. Officer CASE Category
Goody, R. M. HQ-EL/Fox, K. 31-Atmos Sci
Lindzen, R. S. HQ-EL/Quaide, W. L.

NGR 22-007-269 Harvard University 3702
Theoretical research in planetary physics
Period Obligations
09/01/73-02/28/89 FY89: TOTAL: \$868,304
Prin. Invest. NASA Tech. Officer CASE Category
Cameron, A. G. HQ-EL/Boyce, J. M. 32-Geological Sci
HQ-EL/Fox, K.

NGR 22-007-272 Harvard University 3703
Theoretical studies in space astronomy
Period Obligations
09/01/73-09/30/89 FY89: \$105,277 TOTAL: \$870,517
Prin. Invest. NASA Tech. Officer CASE Category
Cameron, A. G. HQ-EZ/Kaluzienski, L. J. 11-Astronomy
HQ-EZ/Runner, A. N.

NGT 00-050-020 Harvard University 3704
NASA graduate student researchers program
Period Obligations
07/01/86-05/31/89 FY89: TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Rosner, R. HQ-XE/Owens, F. C. 11-Astronomy

NGT 00-050-028 Harvard University 3705
NASA graduate student researchers program
Period Obligations
07/01/86-08/31/89 FY89: \$500 TOTAL: \$36,900
Prin. Invest. NASA Tech. Officer CASE Category
Wood, J. A. HQ-LE/Owens, F. C. 32-Geological Sci

NASA'S UNIVERSITY PROGRAM MASSACHUSETTS (Continued)

NGT 00-050-240	Harvard University		3706
	NASA graduate student researchers program		
	<i>Period</i>	<i>Obligations</i>	
	09/01/89-08/31/90	FY89: \$34,000	TOTAL: \$52,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Moran, J. M.	HQ-XE/Owens, F. C.	13-Physics
NGT 00-050-290	Harvard University		3707
	NASA graduate student researchers program		
	<i>Period</i>	<i>Obligations</i>	
	09/01/88-08/31/90	FY89:	TOTAL: \$18,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Grindlay, J. E.	HQ-XE/Owens, F. C.	13-Physics
NGT 00-050-300	Harvard University		3708
	NASA graduate student researchers program		
	<i>Period</i>	<i>Obligations</i>	
	09/01/88-08/31/89	FY89:	TOTAL: \$18,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Stanley, H. E.	HQ-XE/Owens, F. C.	13-Physics
NGT 00-050-352	Harvard University		3709
	NASA graduate student researchers program		
	<i>Period</i>	<i>Obligations</i>	
	09/01/88-08/31/89	FY89:	TOTAL: \$18,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Fazio, G. G.	HQ-XE/Owens, F. C.	11-Astronomy
NGT 00-050-494	Harvard University		3710
	NASA graduate student researchers program		
	<i>Period</i>	<i>Obligations</i>	
	06/01/89-05/31/90	FY89: \$18,000	TOTAL: \$18,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Silvera, I.	HQ-XE/Owens, F. C.	13-Physics
NGT 00-050-537	Harvard University		3711
	NASA graduate student researchers program		
	<i>Period</i>	<i>Obligations</i>	
	07/01/89-06/30/90	FY89: \$18,000	TOTAL: \$18,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	McElroy, M. B.	HQ-XE/Owens, F. C.	31-Atmos Sci
NSG 7176	Harvard University		3712
	Participation in NASA core funding		
	<i>Period</i>	<i>Obligations</i>	
	11/01/75-12/31/89	FY89:	TOTAL: \$2,744,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Shapiro, I. I.	HQ-E/Alexander, J. K.	11-Astronomy
	McElroy, M. B.	HQ-EP/Konkel, R. M.	
NSG 7304	Harvard University		3713
	Absolute transition probabilities in ultraviolet spectra of interstellar molecules		
	<i>Period</i>	<i>Obligations</i>	
	12/15/76-02/14/89	FY89:	TOTAL: \$684,400
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Parkinson, W. H.	HQ-EZ/Stachnik, R. V.	11-Astronomy
		HQ-EZ/Weiler, E. J.	
NAG 1-126	Massachusetts Institute of Technology		3714
	Reliability issues in active control of large flexible space structures		
	<i>Period</i>	<i>Obligations</i>	
	11/15/80-11/14/89	FY89: \$67,424	TOTAL: \$762,791
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Vandervelde, W. E.	LARC/Montgomery, R. C.	41-Aero Engr
	Walker, B.	LARC/Welch, S. S.	
NAG 1-507	Massachusetts Institute of Technology		3715
	Computational fluid dynamics		
	<i>Period</i>	<i>Obligations</i>	
	09/01/84-05/31/90	FY89: \$49,933	TOTAL: \$330,912
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Murman, E. M.	LARC/Melson, N. D.	41-Aero Engr
	Baron, J. R.	LARC/Salas, M. D.	
NAG 1-690	Massachusetts Institute of Technology		3716
	Flight research activities		
	<i>Period</i>	<i>Obligations</i>	
	07/01/86-07/15/90	FY89:	TOTAL: \$30,957
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Hansman, R. J.	LARC/Holmes, B. J.	41-Aero Engr
		LARC/Carden, H. D.	
NAG 1-801	Massachusetts Institute of Technology		3717
	The dynamic control of robotic manipulators in space		
	<i>Period</i>	<i>Obligations</i>	
	08/01/87-07/31/90	FY89: \$369,899	TOTAL: \$608,739
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Dubowsky, S.	LARC/Harrison, F. W.	46-Mech Engr
		LARC/Pennington, J. E.	
NAG 1-836	Massachusetts Institute of Technology		3718
	Low speed flight research with the MIT Dae Dalus and light eagle aircraft		
	<i>Period</i>	<i>Obligations</i>	
	01/12/88-12/31/88	FY89:	TOTAL: \$99,970
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Kerrebrock, J. L.	LARC/Winston, M. M.	41-Aero Engr
	Langford, J. S.		
	Bussolari, S. R.		
NAG 1-855	Massachusetts Institute of Technology		3719
	Validation of an Navier-Stokes code with the NTF delta wing model data		
	<i>Period</i>	<i>Obligations</i>	
	02/18/88-06/30/89	FY89:	TOTAL: \$49,821
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Murman, E. M.	LARC/Melson, N. D.	41-Aero Engr
		LARC/Salas, M. D.	
NAG 1-915	Massachusetts Institute of Technology		3720
	Hybrid scaled models for on orbit research in controlled structures technology		
	<i>Period</i>	<i>Obligations</i>	
	11/01/88-05/31/89	FY89: \$140,000	TOTAL: \$140,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Crawley, E. F.	LARC/Fontana, A.	42-Astro Engr
	Miller, D. W.		
NAG 1-924	Massachusetts Institute of Technology		3721
	New laser materials for laser diode pumping		
	<i>Period</i>	<i>Obligations</i>	
	11/10/88-04/30/90	FY89: \$172,288	TOTAL: \$172,288
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Jenssen, H. P.	LARC/Hess, R. V.	13-Physics
		LARC/Brockman, P.	

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NAG 1-968 Massachusetts Institute of Technology 3722
Spacecraft dynamics characterization and the effects of nonlinear joints
Period *Obligations*
02/09/89-02/08/90 FY89: \$138,931 TOTAL: \$138,931
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Vander Velde, W. E. LARC/Taylor, R. S. 42-Astro Engr
LARC/Sparks, D. W.

NAG 1-991 Massachusetts Institute of Technology 3723
Composite fuselage technology
Period *Obligations*
04/07/89-04/06/90 FY89: \$100,045 TOTAL: \$100,045
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lagace, P. A. LARC/Starnes, J. H. 41-Aero Engr
Graves, M. J. LARC/Shuart, M. J.

NAG 1-996 Massachusetts Institute of Technology 3724
Growth and characterization of high performance photo refractive crystals
Period *Obligations*
05/01/89-12/31/89 FY89: \$100,000 TOTAL: \$100,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Warde, C. LARC/Welch, S. 13-Physics
LARC/Montgomery, R. C.

NAG 2-12 Massachusetts Institute of Technology 3725
Research on visual vestibular interaction and its application to flight simulation
Period *Obligations*
12/01/79-09/30/89 FY89: \$123,373 TOTAL: \$842,411
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Young, L. R. ARC/Lee, A. T. 49-Engr, NEC
Bussolari, S. R. ARC/Shafto, M. G.
Kenyon, R.

NAG 2-251 Massachusetts Institute of Technology 3726
Vortex-wake dynamics: Application to rotor airload calculations
Period *Obligations*
09/01/83-11/30/88 FY89: TOTAL: \$260,444
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Widnall, S. E. ARC/Johnson, W. R. 41-Aero Engr
ARC/Warmbrodt, W.

NAG 2-297 Massachusetts Institute of Technology 3727
Nonlinear and adaptive control systems
Period *Obligations*
06/01/84-01/15/89 FY89: TOTAL: \$470,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Athans, M. ARC/Meyer, G. 49-Engr, NEC

NAG 2-421 Massachusetts Institute of Technology 3728
Calculation methods for rotor wake formation in forward flight
Period *Obligations*
09/01/86-08/31/89 FY89: TOTAL: \$98,835
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Drela, M. ARC/Stremel, P. M. 41-Aero Engr
ARC/Smith, C. A.

NAG 2-445 Massachusetts Institute of Technology 3729
Visual vestibular interaction
Period *Obligations*
01/01/87-12/31/89 FY89: \$85,006 TOTAL: \$317,206
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Young, L. R. ARC/Cohen, M. M. 51-Biological Sci
Oman, C. ARC/Corcoran, M. L.

NAG 2-475 Massachusetts Institute of Technology 3730
Opportunity observations of occultations and eclipses does Pluto have an atmosphere
Period *Obligations*
10/01/87-09/30/89 FY89: \$143,940 TOTAL: \$267,035
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Elliott, J. L. ARC/Haughney, L. C. 11-Astronomy

NAG 2-478 Massachusetts Institute of Technology 3731
The component modelling approach to computer aided conceptual design
Period *Obligations*
06/01/87-05/31/90 FY89: TOTAL: \$94,762
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Drela, M. ARC/Kidwell, G. H. 41-Aero Engr
Kolb, M. A.

NAG 2-582 Massachusetts Institute of Technology 3732
Advanced network architecture
Period *Obligations*
01/01/89-12/31/89 FY89: \$570,200 TOTAL: \$570,200
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Clark, D. D. ARC/Lum, H. 45-Elec Engr
Dertouzos, M. L. ARC/McKellar, D.

NAG 3-328 Massachusetts Institute of Technology 3733
Wave propagation in fiber composites relating to acoustic ultrasonic NDE techniques
Period *Obligations*
10/06/82-07/22/89 FY89: TOTAL: \$259,342
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Williams Jr., J. H. LERC/Kautz, H. E. 47-Materials Engr
Lee, S. S. LERC/Vary, A.

NAG 3-660 Massachusetts Institute of Technology 3734
Direct simulation of 3-D fluid mechanical phenomena in internal flows
Period *Obligations*
10/05/85-12/02/89 FY89: \$53,991 TOTAL: \$197,502
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Covert, E. E. LERC/Adamczyk, J. J. 41-Aero Engr
Tan, C. S.

NAG 3-666 Massachusetts Institute of Technology 3735
Quantitative studies of ice accretion utilizing ultrasonic measurement techniques
Period *Obligations*
11/17/85-01/31/90 FY89: \$46,000 TOTAL: \$151,080
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hansman, R. J. LERC/Potapczuk, M. G. 41-Aero Engr

NAG 3-680 Massachusetts Institute of Technology 3736
Structural properties of high temperature composites
Period *Obligations*
12/26/85-09/30/89 FY89: TOTAL: \$240,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Mandell, J. F. LERC/Chamis, C. C. 41-Aero Engr
LERC/Grady, J. E.

NAG 3-681 Massachusetts Institute of Technology 3737
Current and gradient driven instabilities about the tethered satellite system
Period *Obligations*
12/26/85-12/31/90 FY89: \$50,114 TOTAL: \$180,279
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hastings, D. E. LERC/Kolecki, J. C. 13-Physics
Martinez Sanche, M. LERC/Purvis, C. K.

NASA'S UNIVERSITY PROGRAM **MASSACHUSETTS (Continued)**

NAG 3-695 Massachusetts Institute of Technology 3738
Investigation of interaction between ac power lines and space plasmas

Period	Obligations	
02/01/86-01/15/90	FY89: \$75,712	TOTAL: \$260,048
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hastings, D. E.	LERC/Snyder, D. B.	19-Phys Sci, NEC
Olbert, S.		

NAG 3-731 Massachusetts Institute of Technology 3739
Characterization of the vapor condensation rate on a liquid interface for application in low gravity environments

Period	Obligations	
06/15/86-06/12/90	FY89: \$95,945	TOTAL: \$305,434
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Sonin, A. A.	LERC/Hasan, M. M.	46-Mech Engr
	LERC/Aydelott, J. C.	

NAG 3-770 Massachusetts Institute of Technology 3740
Active stabilization of centrifugal compressors

Period	Obligations	
12/24/86-02/22/90	FY89: \$93,992	TOTAL: \$238,326
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Epstein, A. H.	LERC/Schumann, L. F.	41-Aero Engr
Greitzer, E. M.		

NAG 3-772 Massachusetts Institute of Technology 3741
3D flow in radial turbomachinery and its impact on design

Period	Obligations	
01/01/87-02/28/90	FY89: \$90,000	TOTAL: \$253,046
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Tan, G. S.	LERC/Meitner, P. L.	41-Aero Engr
Hawthorne, W.	LERC/Civinskes, K. C.	

NAG 3-808 Massachusetts Institute of Technology 3742
Solidification processing of dispersed phase reinforced mg alloy composites under 1 G and microgravity conditions

Period	Obligations	
08/04/87-08/03/89	FY89:	TOTAL: \$300,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Cornie, J. A.	LERC/Harf, F. H.	47-Materials Engr
Szekely, J.	LERC/Kohl, F. J.	

NAG 3-819 Massachusetts Institute of Technology 3743
Information requirements for failure detection and isolation in integrated hierarchical control system

Period	Obligations	
09/15/87-04/14/90	FY89: \$69,649	TOTAL: \$196,916
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Vander Velde, W. E.	LERC/Merrill, W. C.	41-Aero Engr

NAG 3-844 Massachusetts Institute of Technology 3744
Unsteady flow in multistage turbomachines

Period	Obligations	
11/05/87-12/04/90	FY89:	TOTAL: \$34,997
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Greitzer, E. M.	LERC/Adamczyk, J. J.	41-Aero Engr

NAG 3-845 Massachusetts Institute of Technology 3745
Nitriding kinetics and interface properties in silicon carbide reinforced reaction bonded silicon nitride composites

Period	Obligations	
12/10/87-12/09/89	FY89: \$81,155	TOTAL: \$156,543
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Haggerty, J. S.	LERC/Bhatt, R. T.	47-Materials Engr

NAG 3-927 Massachusetts Institute of Technology 3746
Advanced ice detection technology for helicopter and aircraft applications

Period	Obligations	
09/01/88-01/31/90	FY89:	TOTAL: \$49,661
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hansman, R. J.	LERC/Reinmann, J. J.	41-Aero Engr

NAG 3-953 Massachusetts Institute of Technology 3747
Inlet distortions in engines on VSTOL aircraft

Period	Obligations	
01/01/89-07/31/90	FY89: \$88,976	TOTAL: \$88,976
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Tan, C. S.	LERC/Drummond, C.	41-Aero Engr
Greitzer, E. M.	LERC/Newman, F. A.	

NAG 3-1013 Massachusetts Institute of Technology 3748
State variable measurement in high speed turbo machinery

Period	Obligations	
02/15/89-02/14/90	FY89: \$139,263	TOTAL: \$139,263
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Epstein, A. H.	LERC/Strazisar, A. J.	41-Aero Engr

NAG 3-1028 Massachusetts Institute of Technology 3749
Computational investigation of the Campbell diffuser concept

Period	Obligations	
04/06/89-04/05/90	FY89: \$91,741	TOTAL: \$91,741
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Jery, B.	LERC/Schumann, L. F.	41-Aero Engr
Tan, C. S.		
Greitzer, E. M.		

NAG 3-1076 Massachusetts Institute of Technology 3750
Heat transfer with combined oscillating pressure and oscillating flow

Period	Obligations	
09/25/89-09/24/90	FY89: \$49,949	TOTAL: \$49,949
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Smith, J. L.	LERC/Tew, R. C.	46-Mech Engr
	LERC/Dudenhoeser, K. E.	

NAG 5-10 Massachusetts Institute of Technology 3751
Improved microwave retrieval techniques for atmospheric temperatures, winds and humidity

Period	Obligations	
02/01/80-12/31/89	FY89: \$148,000	TOTAL: \$1,393,600
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Staelin, D. H.	GSFC/Shiue, J. C.	31-Atmos Sci
Rosenranz, P. W.	GSFC/Wilheit, T. T.	

NAG 5-270 Massachusetts Institute of Technology 3752
Remote sensing of Earth terrain

Period	Obligations	
09/01/82-11/14/89	FY89:	TOTAL: \$573,606
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Oliver, D. O.	GSFC/Oseroff, H.	55-Agriculture Sci
Dewitt, K. J.		

NAG 5-300 Massachusetts Institute of Technology 3753
Seismicity and active tectonics of the Andes and the origin of the Altiplano

Period	Obligations	
03/15/83-06/30/88	FY89:	TOTAL: \$169,304
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Molnar, P.	GSFC/Kouns, C. W.	32-Geological Sci
Burchfiel, B. C.	GSFC/Frey, H.	

**NASA'S UNIVERSITY PROGRAM
MASSACHUSETTS (Continued)**

NAG 5-459 Massachusetts Institute of Technology 3754
Plate motions and deformations from geologic and geodetic data
Period Obligations
08/01/84-12/31/89 FY89: \$87,370 TOTAL: \$381,080
Prin. Invest. NASA Tech. Officer CASE Category
Jordan, T. H. GSFC/Frey, H. V. 32-Geological Sci
Minster, J. B.

NAG 5-510 Massachusetts Institute of Technology 3755
Use of LANDSAT images of vegetation cover to estimate effective hydraulic properties of soil
Period Obligations
02/01/85-09/30/88 FY89: TOTAL: \$260,000
Prin. Invest. NASA Tech. Officer CASE Category
Eagleson, P. S. GSFC/Choudhury, B. 32-Geological Sci
Bras, R. L.

NAG 5-532 Massachusetts Institute of Technology 3756
Flexural deformation of the continental lithosphere of the adriatic sea
Period Obligations
05/01/85-06/30/90 FY89: \$50,000 TOTAL: \$234,185
Prin. Invest. NASA Tech. Officer CASE Category
Royden, L. H. GSFC/Welker, J. E. 32-Geological Sci

NAG 5-537 Massachusetts Institute of Technology 3757
Jupiter radio astronomy studies
Period Obligations
05/01/85-06/30/90 FY89: TOTAL: \$52,240
Prin. Invest. NASA Tech. Officer CASE Category
Staelin, D. H. GSFC/Kaiser, M. L. 13-Physics
GSFC/Desch, M. D.

NAG 5-584 Massachusetts Institute of Technology 3758
Analysis of the solar wind experiment
Period Obligations
10/01/85-01/31/90 FY89: \$99,943 TOTAL: \$334,499
Prin. Invest. NASA Tech. Officer CASE Category
Lazarus, A. J. GSFC/Wales, R. O. 11-Astronomy

NAG 5-737 Massachusetts Institute of Technology 3759
Research relative to lunar laser ranging data
Period Obligations
01/20/86-03/31/90 FY89: \$104,000 TOTAL: \$359,760
Prin. Invest. NASA Tech. Officer CASE Category
King, R. W. GSFC/Frey, H. V. 32-Geological Sci

NAG 5-740 Massachusetts Institute of Technology 3760
Strain accumulation and surface deformation along the San Andreas, California
Period Obligations
03/01/86-03/31/90 FY89: \$53,000 TOTAL: \$213,004
Prin. Invest. NASA Tech. Officer CASE Category
Li, V. C. GSFC/Frey, H. V. 32-Geological Sci

NAG 5-743 Massachusetts Institute of Technology 3761
Extensions and testing the hydrological parameterization of the atmospheric general circulation model
Period Obligations
03/01/86-12/31/89 FY89: \$56,878 TOTAL: \$213,053
Prin. Invest. NASA Tech. Officer CASE Category
Eagleson, P. S. GSFC/Genio, A. D. 31-Atmos Sci

NAG 5-753 Massachusetts Institute of Technology 3762
Interpretation of crustal dynamics data
Period Obligations
03/15/86-04/30/90 FY89: \$52,000 TOTAL: \$209,485
Prin. Invest. NASA Tech. Officer CASE Category
Toksoz, M. N. GSFC/Frey, H. V. 32-Geological Sci

NAG 5-795 Massachusetts Institute of Technology 3763
Rates crustal deformation in Asia and other action continental regions
Period Obligations
06/15/86-06/14/90 FY89: \$68,142 TOTAL: \$231,359
Prin. Invest. NASA Tech. Officer CASE Category
Molnar, P. GSFC/Welker, J. 32-Geological Sci

NAG 5-814 Massachusetts Institute of Technology 3764
The interpretation of crustal dynamics data in terms of plate motions and regional deformation
Period Obligations
09/22/86-03/21/90 FY89: \$164,470 TOTAL: \$561,612
Prin. Invest. NASA Tech. Officer CASE Category
Solomon, S. C. GSFC/Frey, H. V. 32-Geological Sci
Toksoz, M. N.

NAG 5-874 Massachusetts Institute of Technology 3765
Extended magnetic field structures in the ionosphere
Period Obligations
02/15/87-12/31/89 FY89: \$31,000 TOTAL: \$122,000
Prin. Invest. NASA Tech. Officer CASE Category
Sullivan, J. D. GSFC/Ormes, J. A. 12-Chemistry
Davidson, R. C.

NAG 5-927 Massachusetts Institute of Technology 3766
The time evolution of persistent anomalies mechanisms and relationships to variations in eddy activity
Period Obligations
06/15/87-01/14/90 FY89: \$98,000 TOTAL: \$246,000
Prin. Invest. NASA Tech. Officer CASE Category
Dole, R. M. GSFC/Atlas, R. 31-Atmos Sci

NAG 5-977 Massachusetts Institute of Technology 3767
Ultraviolet spectra of active galactic nuclei with strong iron II emission
Period Obligations
09/01/87-08/31/99 FY89: TOTAL: \$15,200
Prin. Invest. NASA Tech. Officer CASE Category
Remillard, R. A. GSFC/Kondo, Y. 11-Astronomy
Tuohy, I. R.
Brissenden, R.

NAG 5-1055 Massachusetts Institute of Technology 3768
Generation of artificial plasma layers by two microwave beams via air breakdown
Period Obligations
06/15/88-01/14/90 FY89: \$93,000 TOTAL: \$143,000
Prin. Invest. NASA Tech. Officer CASE Category
Lee, M. C. GSFC/Benson, R. F. 13-Physics

NAG 5-1061 Massachusetts Institute of Technology 3769
Computational dispersion properties of 2-3 and 4 dimensional grids staggered in space and time
Period Obligations
11/01/88-04/30/89 FY89: TOTAL: \$31,547
Prin. Invest. NASA Tech. Officer CASE Category
Lindzen, R. S. GSFC/Helfand, C. M. 31-Atmos Sci

**NASA'S UNIVERSITY PROGRAM
MASSACHUSETTS (Continued)**

NAG 5-1084 Massachusetts Institute of Technology 3770
Deep thermal structure of rifts and the Backal rift
Period Obligations
10/01/88-03/31/90 FY89: TOTAL: \$59,900
Prin. Invest. NASA Tech. Officer CASE Category
McNutt, M. GSFC/Welker, J. E. 31-Atmos Sci

NAG 5-1102 Massachusetts Institute of Technology 3771
The quasi-biennial oscillation in stratospheric ozone
Period Obligations
10/15/88-10/14/89 FY89: \$35,000 TOTAL: \$35,000
Prin. Invest. NASA Tech. Officer CASE Category
Plumb, R. A. GSFC/Rood, R. B. 31-Atmos Sci
GSFC/Schoeberl, M. R.

NAG 5-1106 Massachusetts Institute of Technology 3772
Preliminary design study and assessment of a disc geometry magnet
Period Obligations
10/15/88-10/14/89 FY89: \$60,000 TOTAL: \$60,000
Prin. Invest. NASA Tech. Officer CASE Category
Marston, P. G. GSFC/Ormes, J. F. 13-Physics

NAG 5-1139 Massachusetts Institute of Technology 3773
The high energy spectrum of a selected quasi stellar object
Period Obligations
06/15/89-06/14/90 FY89: \$10,400 TOTAL: \$10,400
Prin. Invest. NASA Tech. Officer CASE Category
Remillard, R. A. GSFC/West, D. K. 11-Astronomy

NAG 5-1220 Massachusetts Institute of Technology 3774
X-ray spectroscopy of clusters of galaxies; Conduction in cooling flows
Period Obligations
08/15/89-02/14/90 FY89: \$24,472 TOTAL: \$24,472
Prin. Invest. NASA Tech. Officer CASE Category
Bertschinger, E. GSFC/West, D. 11-Astronomy

NAG 5-1225 Massachusetts Institute of Technology 3775
High resolution X-ray spectroscopy of type I supernova remnants
Period Obligations
08/15/89-08/14/90 FY89: \$30,037 TOTAL: \$30,037
Prin. Invest. NASA Tech. Officer CASE Category
Canizares, C. R. GSFC/West, D. 11-Astronomy

NAG 8-84 Massachusetts Institute of Technology 3776
Microgravity solidification of monotectic alloy matrix composite
Period Obligations
12/18/86-07/31/89 FY89: TOTAL: \$119,805
Prin. Invest. NASA Tech. Officer CASE Category
Russell, K. C. MSFC/Currevi, P. A. 47-Materials Engr
MSFC/Strauss, E. M.

NAG 8-493 Massachusetts Institute of Technology 3777
Scientific investigations with the data base HEAO-1 scanning modulator collimator
Period Obligations
10/01/84-09/30/90 FY89: \$133,057 TOTAL: \$492,057
Prin. Invest. NASA Tech. Officer CASE Category
Bradt, H. MSFC/Havrisik, D. 11-Astronomy

NAG 8-494 Massachusetts Institute of Technology 3778
Analysis of data obtained with the HEAO-2 satellite
Period Obligations
10/01/84-09/30/89 FY89: \$307,000 TOTAL: \$1,789,580
Prin. Invest. NASA Tech. Officer CASE Category
Canizares, C. R. MSFC/Havrisik, D. 11-Astronomy

NAG 8-495 Massachusetts Institute of Technology 3779
Analysis and evaluation of data obtained from the HEAO A-4 experiment
Period Obligations
10/01/84-06/30/89 FY89: TOTAL: \$224,952
Prin. Invest. NASA Tech. Officer CASE Category
Lewin, W. G. MSFC/Havrisik, D. 11-Astronomy

NAG 8-673 Massachusetts Institute of Technology 3780
Timing analysis of bright X ray binaries observed with the HEAO 1 scanning modulation collimator
Period Obligations
08/14/87-11/13/88 FY89: TOTAL: \$26,362
Prin. Invest. NASA Tech. Officer CASE Category
Bradt, H. V. MSFC/Harper, B. 11-Astronomy
Remillard, R. A.

NAG 8-674 Massachusetts Institute of Technology 3781
X ray burst and quasi periodic oscillations using EXOSAT database
Period Obligations
10/01/87-09/30/90 FY89: \$147,767 TOTAL: \$222,767
Prin. Invest. NASA Tech. Officer CASE Category
Lewin, W. H. MSFC/Havrisik, D. 11-Astronomy

NAG 8-691 Massachusetts Institute of Technology 3782
Head MC identified objects with astro C visitor investigating program
Period Obligations
12/01/87-12/30/89 FY89: \$56,966 TOTAL: \$98,000
Prin. Invest. NASA Tech. Officer CASE Category
Bradt, H. MSFC/Havrisik, D. 11-Astronomy

NAG 8-700 Massachusetts Institute of Technology 3783
Quasi periodic oscillations from bright galactic bulge sources with ginga
Period Obligations
10/01/87-09/30/89 FY89: \$71,894 TOTAL: \$145,500
Prin. Invest. NASA Tech. Officer CASE Category
Lewin, W. H. MSFC/Havrisik, D. 11-Astronomy

NAG 8-701 Massachusetts Institute of Technology 3784
The atmospheric structures of the binary companions of accretion powered X ray stars
Period Obligations
10/01/87-01/31/90 FY89: \$54,946 TOTAL: \$121,008
Prin. Invest. NASA Tech. Officer CASE Category
Clark, G. C. MSFC/Havrisik, D. 11-Astronomy

NAG 8-762 Massachusetts Institute of Technology 3785
Ginga studies of binary X ray pulsar orbits and searchers for X ray binary pulsations in 1989
Period Obligations
12/01/88-11/30/89 FY89: \$35,400 TOTAL: \$35,400
Prin. Invest. NASA Tech. Officer CASE Category
Rappaport, S. MSFC/Havrisik, D. 11-Astronomy

NAG 9-108 Massachusetts Institute of Technology 3786
Non equilibrium chemistry of the early solar system
Period Obligations
05/01/85-05/01/90 FY89: \$45,000 TOTAL: \$205,010
Prin. Invest. NASA Tech. Officer CASE Category
Prinn, R. G. JSC/Browne, I. D. 47-Materials Engr

**NASA'S UNIVERSITY PROGRAM
MASSACHUSETTS (Continued)**

NAG 9-125 Massachusetts Institute of Technology 3787
Effects of display orientation and graphic input devices on workload and performance in zero gravity

Period	Obligations
03/01/85-01/01/90	FY89: TOTAL: \$450,205
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>
Bussolari, S. R.	JSC/Plaza, A. L.
Lichtenberg, B. K.	JSC/Evans, J. S.
	CASE Category 39-Env Sci, NEC

NAG 9-144 Massachusetts Institute of Technology 3788
Nutritional control of brain neurotransmitters

Period	Obligations
03/15/86-07/01/90	FY89: \$40,000 TOTAL: \$300,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>
Wurtman, R. J.	JSC/Cintron, N. M.
Lieberman, H. R.	
	CASE Category 56-Medical Sciences

NAG 9-244 Massachusetts Institute of Technology 3789
Experiments on the etiology and time course of motion sickness

Period	Obligations
07/01/87-01/01/90	FY89: \$74,250 TOTAL: \$245,161
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>
Oman, C. M.	JSC/Kutyna, F. A.
	CASE Category 56-Medical Sciences

NAG 9-252 Massachusetts Institute of Technology 3790
Oxidation of products of human metabolism in supercritical water

Period	Obligations
09/01/87-02/01/90	FY89: \$55,000 TOTAL: \$145,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>
Tester, J. W.	JSC/Price, D. F.
	CASE Category 43-Chem Engr

NAG 9-302 Massachusetts Institute of Technology 3791
Crystallization processes in the interior of the eucrite parent body

Period	Obligations
07/01/88-07/01/90	FY89: \$37,000 TOTAL: \$72,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>
Grove, T. L.	JSC/Browne, I. D.
	CASE Category 32-Geological Sci

NAG 9-319 Massachusetts Institute of Technology 3792
Automatic grasping an investigation of reflexive behaviors

Period	Obligations
09/01/88-09/01/90	FY89: \$65,000 TOTAL: \$101,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>
Salisbury, J. K.	JSC/Hess, C. W.
	CASE Category 99-Multi-Discip

NAGW 21 Massachusetts Institute of Technology 3793
Continuation of the research program encompassed by space engineering

Period	Obligations
11/01/79-09/30/89	FY89: \$758,000 TOTAL: \$5,268,320
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>
Mar, J. W.	HQ-RC/Montemerlo, M.
Crawley, C. W.	HQ-RM/Ball, A. W.
Miller, R. H.	
	CASE Category 42-Astro Engr

NAGW 474 Massachusetts Institute of Technology 3794
Interpretation of NIMBUS-7 and SAGE-1 aerosol and trace gas data using three-dimensional models

Period	Obligations
04/01/83-09/30/89	FY89: \$85,000 TOTAL: \$565,404
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>
Prinn, R. G.	HQ-EE/Jackman, C. H.
	HQ-EE/Butler, D. M.
	CASE Category 31-Atmos Sci

NAGW 525 Massachusetts Institute of Technology 3795
Studies of global scale circulation processes of the Earth atmosphere

Period	Obligations
11/01/83-09/30/90	FY89: \$159,486 TOTAL: \$1,130,086
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>
Lindzen, R. S.	HQ-EE/Kakar, R. K.
Dole, R.	HQ-EE/Theon, J.
	CASE Category 31-Atmos Sci

NAGW 656 Massachusetts Institute of Technology 3796
Dynamics and structure of the planetary rings

Period	Obligations
08/15/84-02/15/89	FY89: TOTAL: \$213,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>
French, R. G.	HQ-EL/Underwood, J. R.
	HQ-EL/Boyce, J. M.
	CASE Category 32-Geological Sci

NAGW 703 Massachusetts Institute of Technology 3797
Diagnostic studies in relation to the stratosphere troposphere exchange product

Period	Obligations
02/01/85-03/31/89	FY89: TOTAL: \$448,310
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>
Newell, R. E.	HQ-EE/Jackman, C. H.
	HQ-EE/Butler, D. M.
	CASE Category 31-Atmos Sci

NAGW 706 Massachusetts Institute of Technology 3798
Solar system dynamics

Period	Obligations
02/01/85-09/30/89	FY89: \$48,794 TOTAL: \$209,183
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>
Wisdom, J.	HQ-EL/Underwood, J. R.
	HQ-EL/Boyce, J. M.
	CASE Category 32-Geological Sci

NAGW 732 Massachusetts Institute of Technology 3799
Global atmospheric gases experiment (GAGE)

Period	Obligations
11/01/84-03/31/90	FY89: \$103,510 TOTAL: \$415,259
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>
Prinn, R. G.	HQ-EE/McPeters, R. D.
	HQ-EE/Prather, M. J.
	CASE Category 31-Atmos Sci

NAGW 770 Massachusetts Institute of Technology 3800
Optical investigation of comet Halley

Period	Obligations
07/01/85-06/30/89	FY89: \$37,367 TOTAL: \$214,137
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>
Jewitt, D. C.	HQ-EL/Brinton, H. C.
	HQ-EL/Rahe, J. H.
	CASE Category 11-Astronomy

NAGW 821 Massachusetts Institute of Technology 3801
Kinetics of thermochemical gas-solid reactions important in the Venus sulfur cycle

Period	Obligations
11/01/85-10/31/88	FY89: TOTAL: \$225,160
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>
Fegley, B.	HQ-E/Rosendhal, J. D.
	HQ-E/Konkel, R. M.
	CASE Category 31-Atmos Sci

NAGW 988 Massachusetts Institute of Technology 3802
Finite element model of cardiac conduction processes

Period	Obligations
11/01/86-10/31/89	FY89: \$160,232 TOTAL: \$431,555
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>
Cohen, R. J.	HQ-EB/White, R. J.
	CASE Category 56-Medical Sciences

**NASA'S UNIVERSITY PROGRAM
MASSACHUSETTS (Continued)**

NAGW 997 Massachusetts Institute of Technology 3803
Chemical models of the present and primordial atmospheres of the gas giant planets Jupiter, Saturn, Uranus and Neptune

<i>Period</i>	<i>Obligations</i>	
11/01/86-10/31/89	FY89: \$45,560	TOTAL: \$128,070
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Fegley, B.	HQ-EL/Fox, K.	31-Atmos Sci
	HQ-EL/Quaide, W. L.	

NAGW 1048 Massachusetts Institute of Technology 3804
Determination of the general circulation

<i>Period</i>	<i>Obligations</i>	
05/01/87-02/28/90	FY89: \$160,000	TOTAL: \$389,600
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Wunsch, C.	HQ-EE/Richman, J. G.	33-Oceanography
	HQ-EE/Wilson, W. S.	

NAGW 1077 Massachusetts Institute of Technology 3805
Mars tectonics and volcanism

<i>Period</i>	<i>Obligations</i>	
06/01/87-05/30/90	FY89: \$96,000	TOTAL: \$144,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Solomon, S. C.	HQ-EL/Underwood, J. R.	11-Astronomy
	HQ-EL/Boyce, J. M.	

NAGW 1078 Massachusetts Institute of Technology 3806
Chemical pathways from volcanic exhalates to dust storm particulates on Mars

<i>Period</i>	<i>Obligations</i>	
06/01/87-05/31/90	FY89: \$50,000	TOTAL: \$150,155
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Burns, R. G.	HQ-EL/Underwood, J. R.	32-Geological Sci
	HQ-EL/Boyce, J. M.	

NAGW 1092 Massachusetts Institute of Technology 3807
Preliminary testing of telescience concepts utilizing the space life sciences and astronomy test beds and the X ray timing Explorer

<i>Period</i>	<i>Obligations</i>	
05/01/87-06/30/88	FY89:	TOTAL: \$100,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Young, L. R.	HQ-E/Schmerling, E. R.	19-Phys Sci, NEC
Lichtewburg, B. K.	HQ-E/Burnett, P.	
Elliott, J.		

NAGW 1139 Massachusetts Institute of Technology 3808
Southern Hemisphere galactic radiation map at 19.2 GHz

<i>Period</i>	<i>Obligations</i>	
08/01/87-05/31/90	FY89: \$94,680	TOTAL: \$304,063
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Cheng, E. S.	HQ-EZ/Gilett, F. C.	11-Astronomy

NAGW 1168 Massachusetts Institute of Technology 3809
Observations of optical counterparts of gamma ray bursts

<i>Period</i>	<i>Obligations</i>	
09/01/87-12/14/89	FY89:	TOTAL: \$70,125
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Knight, F. K.	HQ-EZ/Kaluzienski, L. J.	42-Astro Engr
	HQ-EZ/Bunner, A. N.	

NAGW 1209 Massachusetts Institute of Technology 3810
Detailed analysis of low energy plasma data

<i>Period</i>	<i>Obligations</i>	
10/01/87-09/30/90	FY89: \$176,968	TOTAL: \$255,476
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
McNutt, R. L.	HQ-EL/Quaide, W. L.	19-Phys Sci, NEC
	HQ-EL/Parks, G.	

NAGW 1272 Massachusetts Institute of Technology 3811
Experimental and theoretical determination of sea state bias in radar altimetry

<i>Period</i>	<i>Obligations</i>	
12/01/87-11/30/89	FY89: \$210,679	TOTAL: \$440,579
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Melville, W. K.	HQ-EE/Lagerloef, G. S.	33-Oceanography
	HQ-EE/Wilson, W. S.	

NAGW 1320 Massachusetts Institute of Technology 3812
Theoretical studies of dark matter astrophysics

<i>Period</i>	<i>Obligations</i>	
04/01/88-10/31/89	FY89: \$60,000	TOTAL: \$170,011
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Joss, P. C.	HQ-EZ/Clayton, G. C.	13-Physics
	HQ-ES/Jones, W. V.	

NAGW 1335 Massachusetts Institute of Technology 3813
Center for space engineering research focused on controlled structures technology

<i>Period</i>	<i>Obligations</i>	
06/01/88-02/28/90	FY89: \$1,000,610	TOTAL: \$1,500,610
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Mar, J. W.	HQ-RM/Mulville, D. R.	49-Engr, NEC
Crawley, E. F.		

NAGW 1377 Massachusetts Institute of Technology 3814
Analysis of ocular torsion data from SL 1D1

<i>Period</i>	<i>Obligations</i>	
06/01/88-12/31/89	FY89: \$30,800	TOTAL: \$55,056
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Oman, C. M.	HQ-EB/White, R. J.	19-Phys Sci, NEC

NAGW 1386 Massachusetts Institute of Technology 3815
Interferometric methods for the detection of planets of other solar systems

<i>Period</i>	<i>Obligations</i>	
08/01/88-07/31/89	FY89:	TOTAL: \$45,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Burke, B. I.	HQ-EL/Rahe, J. H.	11-Astronomy

NAGW 1423 Massachusetts Institute of Technology 3816
Portable high speed photometry systems for observing occultations CCD observations at Mauna Kea

<i>Period</i>	<i>Obligations</i>	
05/01/88-04/30/89	FY89: \$20,000	TOTAL: \$20,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Elliot, J. L.	HQ-EL/Rahe, J. H.	11-Astronomy

NAGW 1450 Massachusetts Institute of Technology 3817
Photometry of pluto-charon mutual events

<i>Period</i>	<i>Obligations</i>	
10/01/88-09/30/90	FY89: \$10,000	TOTAL: \$50,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Binzel, R.	HQ-EL/Rahe, J. H.	11-Astronomy

NAGW 1494 Massachusetts Institute of Technology 3818
Occultation studies of the solar systems

<i>Period</i>	<i>Obligations</i>	
01/01/89-11/30/90	FY89: \$82,413	TOTAL: \$82,413
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Elliot, J. L.	HQ-EL/Rahe, J. H.	11-Astronomy

NASA'S UNIVERSITY PROGRAM **MASSACHUSETTS (Continued)**

NAGW 1532 Massachusetts Institute of Technology 3819
 Plasma turbulence and particle acceleration in the magnetosphere

Period	Obligations	
01/01/89-12/31/89	FY89: \$50,045	TOTAL: \$50,045
Prin. Invest.	NASA Tech. Officer	CASE Category
Chang, T. S.	HQ-ES/Mellott, M. M.	13-Physics
	HQ-ES/Perry, T. W.	

NAGW 1727 Massachusetts Institute of Technology 3827
 Large scale dynamics and transport in the stratosphere

Period	Obligations	
03/01/89-02/28/90	FY89: \$70,920	TOTAL: \$70,920
Prin. Invest.	NASA Tech. Officer	CASE Category
Plumb, R. A.	HQ-EE/McPeters, R. D.	31-Atmos Sci
	HQ-EE/Prather, M. J.	

NAGW 1545 Massachusetts Institute of Technology 3820
 Theoretical studies of collapsed objects in binary stellar systems

Period	Obligations	
01/01/89-12/31/89	FY89: \$35,004	TOTAL: \$35,004
Prin. Invest.	NASA Tech. Officer	CASE Category
Joss, P. C.	HQ-EZ/Kaluzienski, L. J.	11-Astronomy
Rappaport, S.	HQ-EZ/Bunner, A. N.	

NAGW 1762 Massachusetts Institute of Technology 3828
 Electromagnetically driven flow in aqueous systems using laser velocimetry

Period	Obligations	
05/01/89-12/31/89	FY89: \$24,000	TOTAL: \$24,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Szekely, J.	HQ-EN/Crouch, R. K.	19-Phys Sci, NEC

NAGW 1550 Massachusetts Institute of Technology 3821
 The interplanetary medium

Period	Obligations	
12/01/88-11/30/89	FY89: \$125,088	TOTAL: \$125,088
Prin. Invest.	NASA Tech. Officer	CASE Category
Lazarus, A. J.	HQ-ES/Mellott, M. M.	13-Physics
	HQ-ES/Jones, W. V.	

NAGW 1816 Massachusetts Institute of Technology 3829
 Kinetics of thermochemical gas solid reactions important in the Venus atmospheric sulfur cycle

Period	Obligations	
05/01/89-04/30/90	FY89: \$50,060	TOTAL: \$50,060
Prin. Invest.	NASA Tech. Officer	CASE Category
Fegley, B.	HQ-EL/Bergstrahl, J. T.	12-Chemistry

NAGW 1563 Massachusetts Institute of Technology 3822
 Crystal growth of device quality GaAs in space

Period	Obligations	
12/01/88-11/30/89	FY89: \$260,000	TOTAL: \$260,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Lagowski, J.	HQ-EN/Crouch, R. K.	19-Phys Sci, NEC
	HQ-EN/Lemkey, F. D.	

NAS 1-18690 Massachusetts Institute of Technology 3830
 Middeck 0-gravity dynamics experiment

Period	Obligations	
12/06/88-01/30/90	FY89: \$748,700	TOTAL: \$748,700
Prin. Invest.	NASA Tech. Officer	CASE Category
Crowley, E.	LARC/Clark, L. G.	42-Astro Engr
	LARC/Beck, S. M.	

NAGW 1617 Massachusetts Institute of Technology 3823
 Remote sensing of Earth terrain

Period	Obligations	
01/01/89-12/31/89	FY89: \$100,000	TOTAL: \$100,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Kong, J. A.	HQ-EE/Asrar, G.	13-Physics

NAS 3-24875 Massachusetts Institute of Technology 3831
 Undercooling molten alloys in a microgravity environment

Period	Obligations	
05/29/86-01/23/90	FY89: \$70,490	TOTAL: \$509,425
Prin. Invest.	NASA Tech. Officer	CASE Category
Flemings, M. C.	LERC/Harl, F. H.	47-Materials Engr
Shiohara, Y.	LERC/Kohl, F. J.	

NAGW 1667 Massachusetts Institute of Technology 3824
 Inelastic collision processes in ozone and their relation to atmospheric pressure broadening

Period	Obligations	
02/01/89-01/31/90	FY89: \$74,878	TOTAL: \$74,878
Prin. Invest.	NASA Tech. Officer	CASE Category
Steinfeld, J. I.	HQ-EE/Kurylo, M. J.	31-Atmos Sci
	HQ-EE/Tilford, S. G.	

NAS 3-25074 Massachusetts Institute of Technology 3832
 Space experiments on electromagnetically driven flow in metal melts

Period	Obligations	
10/22/86-01/13/90	FY89: \$85,248	TOTAL: \$355,248
Prin. Invest.	NASA Tech. Officer	CASE Category
Szekely, J.	LERC/Harl, F. H.	47-Materials Engr
Gutierrez, E.		

NAGW 1694 Massachusetts Institute of Technology 3825
 Analysis of SAS 3 data on the spectrum and variability of the black hole candidate a0620-00 during its 1975-76 X ray out burst

Period	Obligations	
02/01/89-07/31/90	FY89: \$19,990	TOTAL: \$19,990
Prin. Invest.	NASA Tech. Officer	CASE Category
Clark, G. W.	HQ-EZ/Kaluzienski, L. J.	11-Astronomy
	HQ-EZ/Bunner, A. N.	

NAS 5-27591 Massachusetts Institute of Technology 3833
 Cosmic Background Explorer (COBE) pre-launch science data and post-launch data analysis

Period	Obligations	
08/01/83-12/31/89	FY89: \$351,000	TOTAL: \$1,518,946
Prin. Invest.	NASA Tech. Officer	CASE Category
Weiss, R.	GSFC/Mather, J.	13-Physics

NAGW 1696 Massachusetts Institute of Technology 3826
 Testing ecological optimization hypotheses in semiarid regions using LANDSAT data

Period	Obligations	
01/01/89-12/31/89	FY89: \$100,000	TOTAL: \$100,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Eagleson, P.	HQ-EE/Asrar, G.	39-Env Sci, NEC
	HQ-EE/Ruzek, M.	

NAS 5-28564 Massachusetts Institute of Technology 3834
 Long wavelength photodiode development

Period	Obligations	
08/16/84-09/08/88	FY89:	TOTAL: \$511,975
Prin. Invest.	NASA Tech. Officer	CASE Category
Spears, D.	GSFC/Kostiuk, T.	42-Astro Engr
	GSFC/Mumma, M. J.	

NASA'S UNIVERSITY PROGRAM **MASSACHUSETTS (Continued)**

NAS 5-29116 Massachusetts Institute of Technology 3835
 X ray timing Explorer experiment study of the scanning shadow camera and on-board data system

Period	Obligations	
03/22/85-12/15/89	FY89: \$850,000	TOTAL: \$2,580,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Bradt, H.	GSFC/Schulz, D.	42-Astro Engr

NAS 5-29120 Massachusetts Institute of Technology 3836
 Support for the NASA/GSFC crustal dynamics project

Period	Obligations	
03/25/85-02/07/89	FY89: \$336,952	TOTAL: \$6,874,232
Prin. Invest.	NASA Tech. Officer	CASE Category
Niell, A. E.	GSFC/Wildes, W.	32-Geological Sci
Rogers, A. E.		

NAS 5-29325 Massachusetts Institute of Technology 3837
 Wind spacecraft solar wind experiment

Period	Obligations	
05/12/86-03/31/89	FY89: \$108,891	TOTAL: \$194,882
Prin. Invest.	NASA Tech. Officer	CASE Category
Lazarus, A.	GSFC/Ogilvie, K.	11-Astronomy

NAS 5-30426 Massachusetts Institute of Technology 3838
 Calibration of the gamma ray observatory egret instrument

Period	Obligations	
07/01/88-08/01/88	FY89: \$39,672	TOTAL: \$158,684
Prin. Invest.	NASA Tech. Officer	CASE Category
Nixon, G.	GSFC/Hartman, R. C.	11-Astronomy

NAS 5-30543 Massachusetts Institute of Technology 3839
 Very long baseline interferometry VLBI support to the crustal dynamics project

Period	Obligations	
02/08/89-02/07/94	FY89: \$1,557,548	TOTAL: \$1,557,548
Prin. Invest.	NASA Tech. Officer	CASE Category
Rogers, A. E.	GSFC/Wildes, W. T.	32-Geological Sci
Niell, A. E.		

NAS 5-30550 Massachusetts Institute of Technology 3840
 Faraday cup sensors

Period	Obligations	
03/15/89-03/14/94	FY89: \$450,000	TOTAL: \$450,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Lazarus, J.	GSFC/Ogalvie, K.	42-Astro Engr

NAS 5-33003 Massachusetts Institute of Technology 3841
 Earth observing system interdisciplinary investigation

Period	Obligations	
08/28/89-12/14/90	FY89: \$10,000	TOTAL: \$10,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Eagleson, P.	GSFC/Soffen, G.	39-Env Sci, NEC

NAS 5-33020 Massachusetts Institute of Technology 3842
 Team member proposal for the geodynamics laser ranging system entitled: Relative plate motions and intraplate deformation of the anatolian plate and surrounding regions in the eastern

Period	Obligations	
09/01/89-12/14/90	FY89: \$8,000	TOTAL: \$8,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Reilinger, R.	GSFC/Soffen, G.	39-Env Sci, NEC

NAS 8-35018 Massachusetts Institute of Technology 3843
 Turbine blade-tip seal clearance excitation forces

Period	Obligations	
06/03/83-09/25/91	FY89: \$235,000	TOTAL: \$856,034
Prin. Invest.	NASA Tech. Officer	CASE Category
Sanchez, M. M.	MSFC/Wilmer, G.	46-Mech Engr
Belgacem, J.	MSFC/Gross, L. A.	
Covert, E. E.		

NAS 8-36604 Massachusetts Institute of Technology 3844
 Research study entitled growth of gas crystals from the melt in a partially confined configuration

Period	Obligations	
03/15/85-13/14/89	FY89:	TOTAL: \$289,770
Prin. Invest.	NASA Tech. Officer	CASE Category
Gatos, H. C.	MSFC/Yates, I. C.	54-Env Biology

NAS 8-36748 Massachusetts Institute of Technology 3845
 AXAF Bragg crystal spectrometer/high energy transmission grating spectrometer (BCS/HSTGS)

Period	Obligations	
01/14/86-12/31/89	FY89: \$914,582	TOTAL: \$3,639,033
Prin. Invest.	NASA Tech. Officer	CASE Category
Canizares, C. R.	MSFC/Winkler, C. E.	11-Astronomy

NAS 9-16523 Massachusetts Institute of Technology 3846
 Vestibular experiments in Spacelab

Period	Obligations	
01/01/82-12/01/90	FY89: \$390,000	TOTAL: \$2,854,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Young, L. R.	JSC/Proctor, D. R.	59-Life Sci, NEC

NAS 9-17377 Massachusetts Institute of Technology 3847
 Study of plasma-gas interactions

Period	Obligations	
05/01/85-01/31/90	FY89: \$30,000	TOTAL: \$150,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Yan, T. F.	JSC/Chang, F.	13-Physics

NASW 3904 Massachusetts Institute of Technology 3848
 Filament wound case technical assessment group

Period	Obligations	
11/15/83-06/30/88	FY89:	TOTAL: \$120,615
Prin. Invest.	NASA Tech. Officer	CASE Category
Mar, S. W.	HQ-MO/Bardos, R.	41-Aero Engr

NASW 4372 Massachusetts Institute of Technology 3849
 Japanese astro D X ray astronomy mission

Period	Obligations	
11/01/88-08/31/94	FY89: \$983,000	TOTAL: \$983,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Ricker, G. R.	HQ-EZ/Lintott, J.	11-Astronomy
	GSFC/Ousley, G.	

NCA 2-327 Massachusetts Institute of Technology 3850
 Atmospheric IR fluxes measurements and models

Period	Obligations	
06/01/88-09/31/88	FY89:	TOTAL: \$6,434
Prin. Invest.	NASA Tech. Officer	CASE Category
Newell, R. E.	ARC/Valero, F. P.	31-Atmos Sci

**NASA'S UNIVERSITY PROGRAM
MASSACHUSETTS (Continued)**

NCC 2-231 Massachusetts Institute of Technology 3851

Critical review of food processing problems

Period	Obligations	
01/01/83-08/31/88	FY89:	TOTAL: \$403,319
Prin. Invest.	NASA Tech. Officer	CASE Category
Karel, M.	ARC/MacElroy, R. D.	59-Life Sci, NEC

NCC 2-360 Massachusetts Institute of Technology 3852

Research in telerobotics

Period	Obligations	
06/01/85-10/31/89	FY89: \$40,000	TOTAL: \$300,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Sheridan, T.	ARC/Friedland, P. E.	22-Computer Science
	ARC/Sims, M.	

NCC 2-366 Massachusetts Institute of Technology 3853

Improvement of helicopter blade dynamics by active control of the conventional swash plate

Period	Obligations	
11/01/85-12/31/89	FY89:	TOTAL: \$145,075
Prin. Invest.	NASA Tech. Officer	CASE Category
Ham, N. D.	ARC/Lau, B. H.	41-Aero Engr
	ARC/Snyder, P. K.	

NCC 2-447 Massachusetts Institute of Technology 3854

Improvement of helicopter attitude stability by active control of the conventional swash plate

Period	Obligations	
11/01/86-06/30/90	FY89: \$55,114	TOTAL: \$125,224
Prin. Invest.	NASA Tech. Officer	CASE Category
Ham, N. D.	ARC/Talbot, P. D.	41-Aero Engr
	ARC/Balough, D.	

NCC 2-570 Massachusetts Institute of Technology 3855

Principal investigator in a box

Period	Obligations	
10/01/88-09/30/89	FY89: \$362,190	TOTAL: \$362,190
Prin. Invest.	NASA Tech. Officer	CASE Category
Young, L. R.	ARC/Friedland, P. E.	22-Computer Science
	ARC/Rosenthal, D. A.	

NCC 3-117 Massachusetts Institute of Technology 3856

Shear flow instability and turbulence

Period	Obligations	
10/01/88-08/01/89	FY89: \$20,033	TOTAL: \$40,033
Prin. Invest.	NASA Tech. Officer	CASE Category
Landahl, M. T.	LERC/Goldstein, M. E.	41-Aero Engr

NGL 22-009-015 Massachusetts Institute of Technology 3857

Theoretical and experimental investigations of interplanetary medium and in gamma ray astronomy

Period	Obligations	
01/01/63-06/30/89	FY89:	TOTAL: \$5,711,339
Prin. Invest.	NASA Tech. Officer	CASE Category
Lazarus, A. J.	HQ-EE/Mellott, M. M.	13-Physics
	HQ-EE/Jones, W. V.	

NGL 22-009-640 Massachusetts Institute of Technology 3858

Joint university research program future air transportation technological needs

Period	Obligations	
11/16/71-01/31/92	FY89: \$100,000	TOTAL: \$1,404,988
Prin. Invest.	NASA Tech. Officer	CASE Category
Simpson, R. W.	LARC/Morrell, F. R.	41-Aero Engr

NGR 22-009-277 Massachusetts Institute of Technology 3859

The prebiotic synthesis of polynucleotides and polynucleotide-directed polypeptides

Period	Obligations	
12/01/67-11/30/89	FY89: \$66,000	TOTAL: \$1,211,370
Prin. Invest.	NASA Tech. Officer	CASE Category
Rich, A.	HQ-EB/Rummel, J. D.	12-Chemistry
	HQ-EB/Averner, M.	

NGR 22-009-526 Massachusetts Institute of Technology 3860

Astronomy in the region between 1 mm to 0.1 mm wavelengths

Period	Obligations	
09/22/70-10/31/89	FY89: \$107,138	TOTAL: \$1,393,135
Prin. Invest.	NASA Tech. Officer	CASE Category
Meyer, S.	HQ-EZ/Gilett, F. C.	11-Astronomy
	HQ-EZ/Weiler, E. J.	

NGR 22-009-727 Massachusetts Institute of Technology 3861

Study in numerical modeling of atmospheric phenomena

Period	Obligations	
02/01/73-12/31/89	FY89: \$120,000	TOTAL: \$2,270,920
Prin. Invest.	NASA Tech. Officer	CASE Category
Stone, P. H.	GSFC/Duffy, D.	31-Atmos Sci

NGT 00-050-039 Massachusetts Institute of Technology 3862

NASA graduate student researchers program

Period	Obligations	
07/01/86-12/31/89	FY89:	TOTAL: \$54,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Meyer, S.	HQ-LE/Owens, F. C.	13-Physics

NGT 00-050-045 Massachusetts Institute of Technology 3863

NASA graduate student researchers program

Period	Obligations	
06/01/86-05/31/89	FY89:	TOTAL: \$54,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Jordan, T. H.	HQ-LE/Owens, F. C.	13-Physics

NGT 00-050-077 Massachusetts Institute of Technology 3864

NASA graduate student researchers program

Period	Obligations	
09/01/86-08/31/89	FY89: \$15,000	TOTAL: \$51,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Young, L.	HQ-LE/Owens, F. C.	49-Engr, NEC

NGT 00-050-101 Massachusetts Institute of Technology 3865

NASA graduate student researchers program

Period	Obligations	
06/01/86-05/31/89	FY89:	TOTAL: \$54,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Jordan, T. H.	HQ-LE/Owens, F. C.	13-Physics

NGT 00-050-103 Massachusetts Institute of Technology 3866

NASA graduate student researchers program

Period	Obligations	
06/01/86-12/31/88	FY89:	TOTAL: \$45,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Solomon, S. C.	HQ-LE/Owens, F. C.	13-Physics

NGT 00-050-145 Massachusetts Institute of Technology 3867

NASA graduate student researchers program

Period	Obligations	
09/01/87-08/31/90	FY89: \$18,000	TOTAL: \$54,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Sheridan, T.	HQ-XE/Owens, F. C.	46-Mech Engr

NASA'S UNIVERSITY PROGRAM MASSACHUSETTS (Continued)

NGT 00-050-191 Massachusetts Institute of Technology 3868

NASA graduate student researchers program

Period	FY89:	Obligations	TOTAL:
06/01/87-05/31/89			\$36,000
Prin. Invest.	NASA Tech. Officer	CASE Category	
McIntosh, R. E.	HQ-XE/Owens, F. C.	45-Elec Engr	

NGT 00-050-218 Massachusetts Institute of Technology 3869

NASA graduate student researchers program

Period	FY89:	Obligations	TOTAL:
08/01/87-06/30/89			\$36,000
Prin. Invest.	NASA Tech. Officer	CASE Category	
Young, L. R.	HQ-XE/Owens, F. C.	49-Engr, NEC	

NGT 00-050-292 Massachusetts Institute of Technology 3870

NASA graduate student researchers program

Period	FY89:	Obligations	TOTAL:
08/01/88-07/31/90	\$18,000		\$36,000
Prin. Invest.	NASA Tech. Officer	CASE Category	
Melville, W. K.	HQ-XE/Owens, F. C.	33-Oceanography	

NGT 00-050-323 Massachusetts Institute of Technology 3871

NASA graduate student researchers program

Period	FY89:	Obligations	TOTAL:
08/01/88-07/31/90	\$18,000		\$36,000
Prin. Invest.	NASA Tech. Officer	CASE Category	
Binzel, R.	HQ-XE/Owens, F. C.	13-Physics	

NGT 00-050-364 Massachusetts Institute of Technology 3872

NASA graduate student researchers program

Period	FY89:	Obligations	TOTAL:
08/01/88-08/31/90	\$36,000		\$36,000
Prin. Invest.	NASA Tech. Officer	CASE Category	
Dubowsky, S.	HQ-XE/Owens, F. C.	46-Mech Engr	

NGT 00-050-438 Massachusetts Institute of Technology 3873

NASA graduate student researchers program

Period	FY89:	Obligations	TOTAL:
06/12/89-06/11/90	\$18,000		\$18,000
Prin. Invest.	NASA Tech. Officer	CASE Category	
Toum, K. Y.	HQ-XE/Owens, F. C.	46-Mech Engr	

NGT 00-070-012 Massachusetts Institute of Technology 3874

Graduate student researchers underrepresented minority focus program

Period	FY89:	Obligations	TOTAL:
03/01/87-02/28/90	\$18,000		\$54,000
Prin. Invest.	NASA Tech. Officer	CASE Category	
Dubowsky, S.	HQ-LE/Owens, F. C.	46-Mech Engr	

NGT 00-070-027 Massachusetts Institute of Technology 3875

Graduate student researchers underrepresented minority focus program

Period	FY89:	Obligations	TOTAL:
08/01/87-07/31/88			\$18,000
Prin. Invest.	NASA Tech. Officer	CASE Category	
Wurtman, R. J.	HQ-XE/Owens, F. C.	19-Phys Sci, NEC	

NGT 00-070-066 Massachusetts Institute of Technology 3876

NASA graduate student researchers underrepresented minority focus program

Period	FY89:	Obligations	TOTAL:
11/01/87-10/31/89	\$9,000		\$27,000
Prin. Invest.	NASA Tech. Officer	CASE Category	
Williams, J. H.	HQ-XE/Owens, F. C.	46-Mech Engr	

NGT 00-070-067 Massachusetts Institute of Technology 3877

NASA graduate student researchers underrepresented minority focus program

Period	FY89:	Obligations	TOTAL:
11/01/87-10/31/89	\$18,000		\$36,000
Prin. Invest.	NASA Tech. Officer	CASE Category	
Williams, J. H.	HQ-XE/Owens, F. C.	46-Mech Engr	

NGT 22-009-903 Massachusetts Institute of Technology 3878

NASA graduate student researchers program

Period	FY89:	Obligations	TOTAL:
09/01/85-08/31/88			\$51,367
Prin. Invest.	NASA Tech. Officer	CASE Category	
Prinn, R. G.	HQ-LE/Owens, F. C.	99-Multi-Discip	

NGT 22-009-905 Massachusetts Institute of Technology 3879

NASA graduate student researchers program

Period	FY89:	Obligations	TOTAL:
09/01/85-08/31/88			\$48,163
Prin. Invest.	NASA Tech. Officer	CASE Category	
Perez, L.	HQ-LE/Owens, F. C.	45-Elec Engr	

NSG 3208 Massachusetts Institute of Technology 3880

Strut induced aerodynamic forging functions

Period	FY89:	Obligations	TOTAL:
07/05/78-02/14/90	\$93,514		\$687,266
Prin. Invest.	NASA Tech. Officer	CASE Category	
Greitzer, E. M.	LERC/Newman, F. A.	41-Aero Engr	

NSG 5113 Massachusetts Institute of Technology 3881

Research in stratospheric dynamics

Period	FY89:	Obligations	TOTAL:
07/01/76-11/30/89	\$50,000		\$792,303
Prin. Invest.	NASA Tech. Officer	CASE Category	
Stone, P. H.	GSFC/Rind, D.	31-Atmos Sci	

NSG 7297 Massachusetts Institute of Technology 3882

Studies of stress history of terrestrial lithospheres

Period	FY89:	Obligations	TOTAL:
01/01/77-09/30/89	\$108,000		\$985,477
Prin. Invest.	NASA Tech. Officer	CASE Category	
Solomon, S. C.	HQ-EL/Underwood, J.	32-Geological Sci	
	HQ-EL/Holt, H. E.		

NSG 7331 Massachusetts Institute of Technology 3883

Crystal growth of device quality gallium arsenite in space

Period	FY89:	Obligations	TOTAL:
04/01/79-11/30/88			\$3,722,500
Prin. Invest.	NASA Tech. Officer	CASE Category	
Gatos, H. C.	HQ-EL/Crouch, R. K.	19-Phys Sci, NEC	
	HQ-EL/Schmoll, K. S.		

NSG 7339 Massachusetts Institute of Technology 3884

X-ray balloon observations from the Northern and Southern Hemispheres

Period	FY89:	Obligations	TOTAL:
04/01/77-11/30/89	\$305,000		\$2,564,109
Prin. Invest.	NASA Tech. Officer	CASE Category	
Ricker, G. R.	HQ-EZ/Kaluzienski, L. J.	11-Astronomy	
	HQ-EZ/Bunner, A. N.		

NASA'S UNIVERSITY PROGRAM MASSACHUSETTS (Continued)

NAG 2-423 University of Massachusetts - Amherst 3901
Super resolution observations of disks associated with young stars driving collimated outflows

Period	Obligations	
10/01/86-03/31/89	FY89: \$54,919	TOTAL: \$45,919
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Strom, S. E.	ARC/Haughney, L. C.	11-Astronomy
Strom, K. M.		

NAG 2-540 University of Massachusetts - Amherst 3902
High angular resolution 50 and 100 micron observation of SGRB2 and other galactic center molecular clouds

Period	Obligations	
11/01/88-05/31/90	FY89: \$33,000	TOTAL: \$33,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Goldsmith, P. F.	ARC/Haughney, L. C.	11-Astronomy

NAG 2-578 University of Massachusetts - Amherst 3903
High speed all optical networks

Period	Obligations	
05/01/89-04/30/90	FY89: \$130,000	TOTAL: \$130,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Chlamtac, I.	ARC/Lum, H.	45-Elec Engr
Ganz, A.	ARC/McKellar, D.	

NAG 2-595 University of Massachusetts - Amherst 3904
Design and evaluation of scheduling policies for real-time and non real-time traffic in communication networks

Period	Obligations	
05/01/89-04/30/90	FY89: \$145,000	TOTAL: \$145,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Kurose, J. F.	ARC/Lum, H.	22-Computer Science
Towsley, D.	ARC/McKellar, D.	
Cassandras, C.		

NAG 9-75 University of Massachusetts - Amherst 3905
Archean tectonic style

Period	Obligations	
02/01/84-02/01/90	FY89: \$20,999	TOTAL: \$99,999
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
McGill, G. E.	JSC/Browne, I. D.	32-Geological Sci

NAG 9-291 University of Massachusetts - Amherst 3906
Adaptation to transient postural perturbations

Period	Obligations	
04/01/88-07/01/90	FY89: \$49,500	TOTAL: \$96,688
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Andres, R. O.	JSC/Kutyna, F. A.	56-Medical Sciences

NAGW 436 University of Massachusetts - Amherst 3907
Boundary conditions for the paleoenvironment: Chemical and physical processes in the pre-solar nebula

Period	Obligations	
02/15/83-10/14/89	FY89: \$56,449	TOTAL: \$308,707
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Irvine, W. M.	HQ-EB/Rummel, J. D.	32-Geological Sci
Schloerb, F. P.	HQ-EB/Averner, M.	

NAGW 559 University of Massachusetts - Amherst 3908
Algorithm development to measure sea ice fraction with microwave radiometers

Period	Obligations	
12/01/83-11/30/89	FY89: \$154,380	TOTAL: \$817,153
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Swift, C. T.	HQ-EE/Thomas, R. H.	33-Oceanography
	HQ-EE/Wilson, W. S.	

NAGW 1079 University of Massachusetts - Amherst 3909
The giant polygons of Mars

Period	Obligations	
06/01/87-05/31/90	FY89: \$18,000	TOTAL: \$54,203
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
McGill, G. E.	HQ-EL/Underwood, J. R.	32-Geological Sci
	HQ-EL/Boyce, J. M.	

NAGW 1112 University of Massachusetts - Amherst 3910
Microwave remote sensing of oceanic processes at the air sea interface

Period	Obligations	
06/01/87-11/30/89	FY89: \$114,683	TOTAL: \$379,657
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
McIntosh, R. E.	HQ-EE/Lagerloef, G. S.	33-Oceanography
	HQ-EE/Wilson, W. S.	

NAGW 1236 University of Massachusetts - Amherst 3911
Geologic mapping of southwest central MC 3 quadrangle Mars

Period	Obligations	
10/15/87-10/14/89	FY89: \$10,000	TOTAL: \$20,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Condit, C. D.	HQ-EL/Underwood, J.	32-Geological Sci
	HQ-EL/Boyce, J. M.	

NAGW 1353 University of Massachusetts - Amherst 3912
Exobiological studies related to the VSSR Phobos mission

Period	Obligations	
06/01/88-05/31/90	FY89: \$20,412	TOTAL: \$40,824
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Irvine, W. M.	HQ-EB/Rummel, J. D.	59-Life Sci, NEC

NAGW 1405 University of Massachusetts - Amherst 3913
Models of cometary emission in the 18 cm OH transitions the observed behavior of comet Halley by a worldwide network of radio telescopes

Period	Obligations	
03/01/88-10/31/89	FY89: \$31,650	TOTAL: \$31,650
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Schloerb, F. P.	HQ-EL/Fox, K.	11-Astronomy
	HQ-EL/Quade, W. L.	

NAGW 1417 University of Massachusetts - Amherst 3914
The evolution of young stellar object disks and their environment

Period	Obligations	
04/01/88-10/31/89	FY89: \$49,957	TOTAL: \$49,957
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Strom, S. E.	HQ-EL/Rahe, J. H.	11-Astronomy

NAGW 1483 University of Massachusetts - Amherst 3915
Studies of radiative transfer in planetary atmospheres

Period	Obligations	
01/01/88-12/31/89	FY89: \$56,278	TOTAL: \$56,278
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Irvine, W. M.	HQ-EC/Rahe, J.	11-Astronomy

NAGW 1524 University of Massachusetts - Amherst 3916
Microbial contributions to the Precambrian Earth

Period	Obligations	
01/01/89-12/31/89	FY89: \$89,850	TOTAL: \$89,850
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Margulis, L.	HQ-EB/Rummel, J. D.	54-Env Biology

**NASA'S UNIVERSITY PROGRAM
MASSACHUSETTS (Continued)**

NAGW 1659 University of Massachusetts - Amherst 3917
Focal plane arrays for submillimeter waves using two-dimensional electron gas mixer elements

Period	Obligations	
03/01/89-02/28/90	FY89: \$131,983	TOTAL: \$131,983
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Yngvesson, K. S.	HQ-E/Alexander, J. K.	45-Elec Engr
	HQ-E/Holland, D. A.	

NAS 1-18310 University of Massachusetts - Amherst 3918
Development of theoretical models of integrated millimeter wave antennas

Period	Obligations	
08/20/86-12/20/89	FY89:	TOTAL: \$185,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Yngvesson, S.	LARC/Bailey, M. C.	29-Math/Cmputer, NEC
Schaubert, D.	LARC/Campbell, T. G.	
Stephan, K.		

NAS 5-29385 University of Massachusetts - Amherst 3919
Development of I band airborne thinned array radiometer

Period	Obligations	
02/18/87-11/15/90	FY89:	TOTAL: \$119,007
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Swift, C. T.	GSFC/Le Vine, D. M.	45-Elec Engr

NGL 22-010-023 University of Massachusetts - Amherst 3920
Theoretical studies of diffuse reflection and transmission of radiation in planetary atmospheres

Period	Obligations	
05/24/67-06/30/89	FY89: \$17,342	TOTAL: \$972,732
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Irvine, W. M.	HQ-EL/Brinton, H. C.	11-Astronomy
	HQ-EL/Rahe, J. H.	

NGR 22-010-076 University of Massachusetts - Amherst 3921
Reconnaissance study of large geologic ring structures on Mars

Period	Obligations	
05/19/70-10/31/89	FY89: \$25,419	TOTAL: \$622,688
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
McGill, G. E.	HQ-EL/Underwood, J.	32-Geological Sci
	HQ-EL/Boyce, J. M.	

NGT 00-050-038 University of Massachusetts - Amherst 3922
NASA graduate student researchers program

Period	Obligations	
08/01/86-07/31/89	FY89:	TOTAL: \$52,700
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Swift, C. T.	HQ-LE/Owens, F. C.	45-Elec Engr

NGT 00-050-161 University of Massachusetts - Amherst 3923
NASA graduate student researchers program

Period	Obligations	
07/01/87-06/30/90	FY89: \$18,000	TOTAL: \$54,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Brown, L.	HQ-XE/Owens, F. C.	32-Geological Sci

NGT 00-050-397 University of Massachusetts - Amherst 3924
NASA graduate student researchers program

Period	Obligations	
04/01/89-03/31/90	FY89: \$17,800	TOTAL: \$17,800
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Fisher, D. L.	HQ-XE/Owens, F. C.	49-Engr, NEC

NGT 00-050-485 University of Massachusetts - Amherst 3925
NASA graduate student researchers program

Period	Obligations	
07/01/89-06/30/90	FY89: \$18,000	TOTAL: \$18,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
McIntosh, R. E.	HQ-XE/Owens, F. C.	45-Elec Engr

NGT 00-050-487 University of Massachusetts - Amherst 3926
NASA graduate student researchers program

Period	Obligations	
07/01/89-06/30/90	FY89: \$18,000	TOTAL: \$18,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Swift, C. T.	HQ-XE/Owens, F. C.	19-Phys Sci, NEC

NGT 00-070-009 University of Massachusetts - Amherst 3927
Graduate student researchers underrepresented minority focus program

Period	Obligations	
01/01/87-12/31/89	FY89: \$9,000	TOTAL: \$45,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Irvine, W. M.	HQ-LE/Owens, F. C.	13-Physics

NGT 00-070-037 University of Massachusetts - Amherst 3928
Graduate student researchers underrepresented minority focus program

Period	Obligations	
09/01/87-08/31/90	FY89: \$18,000	TOTAL: \$54,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
McIntosh, R. E.	HQ-XE/Owens, F. C.	45-Elec Engr

NGT 00-070-121 University of Massachusetts - Amherst 3929
NASA graduate student researchers underrepresented minority focus program

Period	Obligations	
07/01/89-06/30/90	FY89: \$18,000	TOTAL: \$18,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Swift, C. T.	HQ-XE/Owens, F. C.	49-Engr, NEC

NAG 5-438 Wellesley College 3930
Search for technician in barium stars

Period	Obligations	
07/15/84-10/31/87	FY89:	TOTAL: \$9,867
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Marenin, I. L.	GSFC/Kondo, Y.	11-Astronomy
Carpenter, K. G.		

NAG 5-1213 Wellesley College 3931
The chromosphere of a selected eclipsing binary and the distribution of circumstellar dust around red giants and supergiants

Period	Obligations	
08/01/89-07/31/90	FY89: \$20,450	TOTAL: \$20,450
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Bauer, W. H.	GSFC/West, D.	11-Astronomy

NAGW 1368 Wellesley College 3932
Dynamics and structure of planetary rings

Period	Obligations	
02/16/88-09/30/89	FY89: \$27,500	TOTAL: \$50,500
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
French, R. G.	HQ-EL/Underwood, J.	32-Geological Sci
	HQ-EL/Boyce, J. M.	

**NASA'S UNIVERSITY PROGRAM
MASSACHUSETTS (Continued)**

NAGW 1497 Wellesley College 3933
Structure of the uranian rings from Voyager and earthbased observations
Period *Obligations*
11/01/88-10/31/89 FY89: \$32,000 TOTAL: \$32,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
French, R. G. HQ-EL/Quaide, W. L. 19-Phys Sci, NEC

NGT 22-005-900 Wentworth Institute of Technology 3934
Massachusetts pre-engineering program
Period *Obligations*
06/01/85-08/31/89 FY89: TOTAL: \$284,395
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Mullins, R. T. HQ-U/White, B. 41-Aero Engr

NAG 3-610 Western New England College 3935
Mixer ejector program
Period *Obligations*
03/01/85-12/31/88 FY89: TOTAL: \$149,905
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Presz, W. M. LERC/Bishop, A. R. 41-Aero Engr

NSG 5376 Wheaton College 3936
Ultraviolet spectrophotometry of planetary nebulae
Period *Obligations*
07/01/79-02/28/89 FY89: TOTAL: \$121,696
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Barker, T. GSFC/Kondo, Y. 11-Astronomy

NAG 5-1029 Williams College 3937
Mass loss from IUE observations of rapidly rotating hot stars
Period *Obligations*
12/15/87-12/14/88 FY89: TOTAL: \$6,644
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Friend, D. B. GSFC/Kondo, Y. 11-Astronomy

NAGW 1049 Williams College 3938
Involvement of calcium polyamines and phenyl propanoid derivatives in the regulation of plant growth and lignification in response to gravity
Period *Obligations*
02/15/87-10/31/88 FY89: TOTAL: \$20,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Sloam, R. D. HQ-ER/Halstead, T. W. 51-Biological Sci

NAGW 1382 Williams College 3939
Amine oxidase and calcium-dependent peroxidase involvement in differential growth responses of gravistimulated plants
Period *Obligations*
07/01/88-06/30/90 FY89: \$45,000 TOTAL: \$90,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Slocum, R. D. HQ-EB/Halstead, T. W. 51-Biological Sci

NAG 9-69 Woods Hole Oceanographic Institution 3940
Helium isotope studies of diamonds and inclusions within diamonds
Period *Obligations*
02/01/84-12/01/89 FY89: TOTAL: \$145,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Kurz, M. D. JSC/Phinney, W. C. 32-Geological Sci

NAGW 606 Woods Hole Oceanographic Institution 3941
Regulation of gethylated gas emission from coastal and inland salt gasses
Period *Obligations*
02/01/84-05/14/90 FY89: \$90,000 TOTAL: \$478,713
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Dacey, J. H. HQ-EB/Averner, M. 51-Biological Sci
Wake-ham, S. G. HQ-EB/Devincenzi, D. L.
King, G. M.

NAGW 1024 Woods Hole Oceanographic Institution 3942
Global ocean wave spectral information from space
Period *Obligations*
12/01/86-10/31/89 FY89: \$20,909 TOTAL: \$65,783
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Graber, H. C. HQ-EE/Lagerloef, G. S. 33-Oceanography
HQ-EE/Wilson, W. S.

NAGW 1026 Woods Hole Oceanographic Institution 3943
Direct estimation of the geostrophic sea surface topography of the Gulf Stream
Period *Obligations*
01/01/87-07/31/88 FY89: TOTAL: \$32,994
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Joyce, T. M. HQ-EE/Richman, J. G. 33-Oceanography
HQ-EE/Wilson, W. S.

NAGW 1314 Woods Hole Oceanographic Institution 3944
Average seasonal North Atlantic CO2 cycling
Period *Obligations*
04/01/88-07/31/89 FY89: TOTAL: \$75,432
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Brewer, P. G. HQ-EE/Yoder, J. A. 33-Oceanography
Glover, D. M. HQ-EE/Wilson, S. W.

NAGW 1666 Woods Hole Oceanographic Institution 3945
Gulf Stream upper ocean studies
Period *Obligations*
01/01/89-12/31/89 FY89: \$30,000 TOTAL: \$30,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Kelly, K. A. HQ-EE/Lagerloef, G. S. 33-Oceanography
Joyce, T. M. HQ-EE/Wilson, W. S.

NAGW 1675 Woods Hole Oceanographic Institution 3946
Wavetank investigations of short wind waves and scattometer model
Period *Obligations*
01/01/89-12/31/89 FY89: \$30,000 TOTAL: \$30,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Plant, W. J. HQ-EE/Legrloef, G. S. 33-Oceanography

NAS 5-30572 Woods Hole Oceanographic Institution 3947
EOS interdisciplinary investigation Earth observing system
Period *Obligations*
07/25/89-12/14/90 FY89: \$33,000 TOTAL: \$33,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Brewer, P. G. GSFC/Soften, G. 33-Oceanography

NGT 00-050-456 Woods Hole Oceanographic Institution 3948
NASA graduate student researchers program
Period *Obligations*
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Dacey, J. W. HQ-XE/Owens, F. C. 33-Oceanography

**NASA'S UNIVERSITY PROGRAM
MASSACHUSETTS (Continued)**

NAG 1-809 Worcester Polytechnic Institute 3949
The use of evidence flow graphs for performing validation and verification of expert systems
Period *Obligations*
08/06/87-11/05/88 FY89: TOTAL: \$29,997
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Green, P. E. LARC/Johnson, S. C. 22-Computer Science
Becker, L. A.

NAG 1-964 Worcester Polytechnic Institute 3950
Performing the validation and verification of intelligent systems
Period *Obligations*
01/23/89-12/22/90 FY89: \$171,000 TOTAL: \$171,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Green, P. E. LARC/Johnson, S. C. 22-Computer Science
Becker, L. A.
Duckworth, R. J.

NAG 3-821 Worcester Polytechnic Institute 3951
Determination of corporate preception of safety related barriers to commercial and scientific uses of the space station
Period *Obligations*
09/20/87-12/30/89 FY89: TOTAL: \$50,119
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Custer, R. L. LERC/Friedman, R. 79-Soc Sci, NEC
Wilkes, J. M.

NAG 5-1138 Worcester Polytechnic Institute 3952
Two dimensional fast Fourier transform machine for use in optical array interferometry
Period *Obligations*
06/01/89-01/31/90 FY89: \$15,000 TOTAL: \$15,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Boriakoff, F. U. GSFC/Chin, G. 22-Computer Science
GSFC/Florez, J.

NAG 8-619 Worcester Polytechnic Institute 3953
Large zeolites grown in space
Period *Obligations*
02/01/87-05/31/88 FY89: TOTAL: \$10,818
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Tuler, F. R. MSFC/Atkins, H. L. 47-Materials Engr

NAG 8-709 Worcester Polytechnic Institute 3954
Government support for technology development
Period *Obligations*
03/01/88-07/31/89 FY89: TOTAL: \$9,842
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Tuler, F. R. MSFC/Snoddy, W. C. 79-Soc Sci, NEC

NAG 9-221 Worcester Polytechnic Institute 3955
Kinetics of ilmenite oxidation and reduction
Period *Obligations*
04/01/87-08/01/90 FY89: \$30,000 TOTAL: \$111,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Sacco, A. JSC/Roberts, B. 12-Chemistry

NGT 00-050-428 Worcester Polytechnic Institute 3956
NASA graduate student researchers program
Period *Obligations*
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Durgin, W. HQ-XE/Owens, F. C. 46-Mech Engr

MICHIGAN

NAG 9-338 Grand Valley State University 3957
Behavior of inventories at remote sites
Period *Obligations*
03/01/89-05/01/89 FY89: \$8,011 TOTAL: \$8,011
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lewis, W. C. JSC/Trevino, R. C. 19-Phys Sci, NEC

NAG 2-362 Michigan State University 3958
Effects of micro-gravity on growth hormone concentration and distribution in plants
Period *Obligations*
07/01/85-11/30/89 FY89: \$125,152 TOTAL: \$328,738
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bandurski, R. S. ARC/Winget, C. M. 51-Biological Sci
ARC/Ballard, R. W.

NAG 3-595 Michigan State University 3959
Structural vibrational and electronic properties of intercalated graphite fibers
Period *Obligations*
01/02/85-10/01/88 FY89: TOTAL: \$104,842
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Solin, S. A. LERC/Gaier, J. 13-Physics

NAG 3-670 Michigan State University 3960
Novel high melting thermally stable organic compound
Period *Obligations*
11/15/85-05/09/89 FY89: TOTAL: \$180,841
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hart, H. LERC/Meador, M. A. 12-Chemistry

NAG 3-760 Michigan State University 3961
Generation and diagnostics of suspended high power microwave discharges
Period *Obligations*
01/30/87-01/28/90 FY89: \$75,000 TOTAL: \$200,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Smussen, J. A. LERC/Power, J. L. 13-Physics
Hawley, M.

NAG 3-853 Michigan State University 3962
Stratified charge rotary engine combustion studies
Period *Obligations*
12/24/87-12/31/89 FY89: \$198,886 TOTAL: \$373,603
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Shock, H. J. LERC/Nguyen, H. L. 46-Mech Engr
Somerton, C.

NAG 5-802 Michigan State University 3963
Spectrophotometric synthesis study of a selected eclipsing binary
Period *Obligations*
07/15/86-07/14/88 FY89: TOTAL: \$11,721
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Linnell, A. P. GSFC/Kondo, Y. 11-Astronomy

NAG 5-1189 Michigan State University 3964
Far ultraviolet light curve analysis of the interacting binary system SV centaur
Period *Obligations*
08/01/89-01/31/90 FY89: \$17,750 TOTAL: \$17,750
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Linnell, A. P. GSFC/West, D. 11-Astronomy

NASA'S UNIVERSITY PROGRAM **MICHIGAN (Continued)**

NAGW 97 Michigan State University 3965
 An attempt to localize and identify the gravity sensing mechanism of plants

Period	Obligations	
08/01/80-10/31/89	FY89: \$48,000	TOTAL: \$563,067
Prin. Invest.	NASA Tech. Officer	CASE Category
Bandurski, R. S.	HQ-EB/Halstead, T. W.	51-Biological Sci

NAGW 1695 Michigan State University 3966
 Solar convective dynamics and oscillations

Period	Obligations	
12/01/88-11/30/89	FY89: \$33,530	TOTAL: \$33,530
Prin. Invest.	NASA Tech. Officer	CASE Category
Stein, R. F.	HQ-ES/Bohlin, J. D.	13-Physics
	HQ-ES/Kane, S.	

NGT 00-050-241 Michigan State University 3967
 NASA graduate student researchers program

Period	Obligations	
09/15/87-09/14/90	FY89: \$36,000	TOTAL: \$54,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Poff, K. L.	HQ-XE/Owens, F. C.	19-Phys Sci, NEC

NAG 1-717 Michigan Technological University 3968
 Analysis of wind shear turbulence

Period	Obligations	
12/01/86-08/31/88	FY89:	TOTAL: \$31,752
Prin. Invest.	NASA Tech. Officer	CASE Category
Trevino, G.	LARC/McKissick, B. T.	46-Mech Engr
	LARC/Bowles, R. L.	

NAG 3-216 Michigan Technological University 3969
 Structure property effects of tantalum additions to nickel-base superalloys

Period	Obligations	
10/20/81-04/18/97	FY89:	TOTAL: \$372,678
Prin. Invest.	NASA Tech. Officer	CASE Category
Heckel, R. W.	LERC/Dreshfield, R. L.	12-Chemistry
Pletka, B. J.	LERC/MacKay, R. A.	

NAG 3-519 Michigan Technological University 3970
 Raman structural studies of the nickel electrode

Period	Obligations	
02/20/84-02/22/90	FY89: \$25,000	TOTAL: \$180,013
Prin. Invest.	NASA Tech. Officer	CASE Category
Cornilsen, B. C.	LERC/Reid, M. A.	49-Engr, NEC
	LERC/O'donnell, P.	

NAG 3-560 Michigan Technological University 3971
 Development and prevention of channel segregation during alloy solidification

Period	Obligations	
06/05/84-12/22/89	FY89:	TOTAL: \$286,198
Prin. Invest.	NASA Tech. Officer	CASE Category
Hellawell, A.	LERC/De Grah, H.	47-Materials Engr
Sarazin, J. R.	LERC/Gray, H.	

NAG 3-711 Michigan Technological University 3972
 Film condensation under microgravity conditions

Period	Obligations	
03/10/86-03/23/90	FY89: \$80,577	TOTAL: \$289,850
Prin. Invest.	NASA Tech. Officer	CASE Category
Suryanarayana, N. V.	LERC/McQuillen, J.	46-Mech Engr
Narain, A.		

NAG 3-1017 Michigan Technological University 3973
 Validation of amputational fluid dynamic code

Period	Obligations	
04/01/89-03/31/90	FY89: \$27,830	TOTAL: \$27,830
Prin. Invest.	NASA Tech. Officer	CASE Category
Arici, O.	LERC/Roelke, R. J.	41-Aero Engr

NGT 00-070-154 Michigan Technological University 3974
 NASA graduate student researchers underrepresented minority focus program

Period	Obligations	
08/01/89-07/31/90	FY89: \$18,000	TOTAL: \$18,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Hellawell, A.	HQ-XE/Owens, F. C.	47-Materials Engr

NAG 1-296 University of Michigan - Ann Arbor 3975
 The performance and evaluation of real-time multicomputer control systems

Period	Obligations	
09/01/82-12/31/89	FY89: \$120,000	TOTAL: \$827,451
Prin. Invest.	NASA Tech. Officer	CASE Category
Shin, K. G.	LARC/Butler, R. W.	22-Computer Science
Kim, B. K.	LARC/Lupton, A. O.	

NAG 1-492 University of Michigan - Ann Arbor 3976
 Design and evaluation of flight crucial control computers

Period	Obligations	
09/01/84-04/30/90	FY89: \$30,000	TOTAL: \$149,884
Prin. Invest.	NASA Tech. Officer	CASE Category
Shin, K. G.	LARC/Butler, R. W.	22-Computer Science
	LARC/Finelli, G. B.	

NAG 1-607 University of Michigan - Ann Arbor 3977
 Micro and macro approach to tough polymers for composites

Period	Obligations	
07/12/85-03/31/89	FY89:	TOTAL: \$220,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Yee, A. F.	LARC/Johnston, N. J.	47-Materials Engr
	LARC/Hinkley, J. A.	

NAG 1-817 University of Michigan - Ann Arbor 3978
 High resolution Doppler lidar

Period	Obligations	
10/01/87-03/31/89	FY89:	TOTAL: \$265,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Hays, P. B.	LARC/Maddrea, G. L.	13-Physics
Abreu, V. J.	LARC/McMaster, L. R.	
Kennedy, B. C.		

NAG 1-869 University of Michigan - Ann Arbor 3979
 An adaptive multi grid code for fluid dynamics based on genuinely multi dimensional concepts

Period	Obligations	
03/24/88-10/31/89	FY89: \$47,323	TOTAL: \$94,640
Prin. Invest.	NASA Tech. Officer	CASE Category
Van Leer, B.	LARC/Thomas, J. L.	21-Mathematics
Powell, K.	LARC/Anderson, W. K.	

NAG 1-887 University of Michigan - Ann Arbor 3980
 Distributed fault-tolerant architectures

Period	Obligations	
06/01/88-12/31/89	FY89:	TOTAL: \$60,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Shin, K. C.	LARC/Elks, C. R.	22-Computer Science
	LARC/Bryant, W. H.	

NASA'S UNIVERSITY PROGRAM
MICHIGAN (Continued)

NAG 1-981 University of Michigan - Ann Arbor 3981
 Advanced information processing system
Period *Obligations*
 02/17/89-02/16/90 FY89: \$100,000 TOTAL: \$100,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Shin, K. G. LARC/White, A. L. 22-Computer Science

NAG 1-1040 University of Michigan - Ann Arbor 3982
 Fiber buckling in laminated plates
Period *Obligations*
 10/01/89-09/30/90 FY89: \$31,620 TOTAL: \$31,620
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Waas, A. M. LARC/Shuart, M. J. 41-Aero Engr
 LARC/Jegley, D. C.

NAG 2-325 University of Michigan - Ann Arbor 3983
 Mammalian gravity receptors structure and metaboli
Period *Obligations*
 11/01/84-08/31/87 FY89: TOTAL: \$132,350
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Welsh, M. J. ARC/Corcoran, M. L. 51-Biological Sci
 ARC/Oyama, J.

NAG 2-350 University of Michigan - Ann Arbor 3984
 Intelligent multi sensor integration
Period *Obligations*
 05/01/85-05/31/88 FY89: TOTAL: \$256,668
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Volz, R. A. ARC/Friedland, P. E. 22-Computer Science
 Jain, R. ARC/Bull, J. S.
 Weymouth, T.

NAG 2-440 University of Michigan - Ann Arbor 3985
 Requirements for an integrated simulation program
Period *Obligations*
 01/01/87-11/30/89 FY89: \$146,038 TOTAL: \$216,101
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Clipson, C. W. ARC/Harrison, R. L. 69-Psych, NEC
 ARC/Cohen, M. M.

NAG 2-488 University of Michigan - Ann Arbor 3986
 Interdisciplinary scientist on the Pioneer Venus mission
Period *Obligations*
 01/01/88-12/31/89 FY89: \$130,000 TOTAL: \$274,893
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Donahue, T. ARC/Lasher, L. E. 11-Astronomy
 ARC/Craig, R. A.

NAG 2-491 University of Michigan - Ann Arbor 3987
 Interdisciplinary scientist Pioneer Venus missions
Period *Obligations*
 10/01/87-10/31/89 FY89: \$140,000 TOTAL: \$275,277
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Nagy, A. ARC/Lasher, L. E. 11-Astronomy
 ARC/Craig, R. A.

NAG 2-518 University of Michigan - Ann Arbor 3988
 Investigation of some aspects of the solar wind Venus interactions
Period *Obligations*
 09/15/88-03/14/90 FY89: TOTAL: \$40,355
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Fontheim, E. G. ARC/Lasher, L. E. 11-Astronomy
 ARC/Fimmel, R. O.

NAG 2-541 University of Michigan - Ann Arbor 3989
 A new technique for simulating composite material and its application to electromagnetics in conjunction with the conjugate gradient FFT method
Period *Obligations*
 09/01/88-08/31/90 FY89: \$50,000 TOTAL: \$100,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Volakis, J. L. ARC/Woo, A. C. 45-Elec Engr

NAG 3-589 University of Michigan - Ann Arbor 3990
 Study of forced convection boiling under reduced gravity
Period *Obligations*
 01/02/85-01/31/90 FY89: \$77,997 TOTAL: \$355,079
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Merte, H. LERC/McQuillen, J. 46-Mech Engr

NAG 3-618 University of Michigan - Ann Arbor 3991
 Microwave and millimeter wave power generation
Period *Obligations*
 02/28/85-06/26/88 FY89: TOTAL: \$142,604
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Haddad, G. I. LERC/Dickman, J. E. 45-Elec Engr
 East, J. R.

NAG 3-661 University of Michigan - Ann Arbor 3992
 Structural optimization methods applied to the analysis and computational solution of contact problems in aerospace engines and mechanisms
Period *Obligations*
 10/05/85-06/30/89 FY89: TOTAL: \$194,364
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Kikuchi, N. LERC/Steinetz, B. M. 41-Aero Engr
 Taylor, J. E. LERC/Kiraly, L. J.

NAG 3-663 University of Michigan - Ann Arbor 3993
 Fundamental study of nucleate pool boiling under microgravity
Period *Obligations*
 10/05/85-01/31/90 FY89: \$139,931 TOTAL: \$579,903
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Merte, H., Jr. LERC/Chiaromonte, F. P. 46-Mech Engr
 Weinzierl, A.

NAG 3-850 University of Michigan - Ann Arbor 3994
 Assessment of use of slush gelled and gelled slush cryogenic propellants in space missions
Period *Obligations*
 12/05/87-12/31/89 FY89: \$100,317 TOTAL: \$203,813
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Sonntag, R. E. LERC/Hardy, T. L. 43-Chem Engr
 Kavcany, M. LERC/Dewitt, R. L.

NAG 3-903 University of Michigan - Ann Arbor 3995
 Capillary convection with crystal growth
Period *Obligations*
 05/16/88-05/15/90 FY89: \$51,103 TOTAL: \$102,103
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Yang, W. J. LERC/Chai, A. T. 19-Phys Sci, NEC

NAG 3-951 University of Michigan - Ann Arbor 3996
 Structure and stability of metal aggregation on conducting substrates
Period *Obligations*
 11/14/88-11/13/89 FY89: \$80,689 TOTAL: \$80,689
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Schwank, J. LERC/Singer, J. 99-Multi-Discip
 LERC/Fielder, W. L.

NASA'S UNIVERSITY PROGRAM
MICHIGAN (Continued)

NAG 3-988 University of Michigan - Ann Arbor 3997
 High performance electronic devices at cryogenic temperatures 77k

<i>Period</i>	<i>Obligations</i>	
01/23/89-01/22/90	FY89: \$80,000	TOTAL: \$80,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Bhattacharga, P. K.	LERC/Alterovitz, S. A.	45-Elec Engr

NAG 5-843 University of Michigan - Ann Arbor 4005
 Dielectric properties of rocks and minerals

<i>Period</i>	<i>Obligations</i>	
09/15/86-11/15/88	FY89:	TOTAL: \$50,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Ulaby, F. T.	GSFC/Garvin, J. B.	32-Geological Sci

NAG 5-419 University of Michigan - Ann Arbor 3998
 Research relative to advanced langmun probes

<i>Period</i>	<i>Obligations</i>	
05/01/84-01/31/90	FY89: \$39,443	TOTAL: \$138,676
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Carignan, G. R.	GSFC/Brace, L. H.	31-Atmos Sci

NAG 5-844 University of Michigan - Ann Arbor 4006
 Plasma density bulge in front of Venus bow shock

<i>Period</i>	<i>Obligations</i>	
09/15/86-08/31/88	FY89:	TOTAL: \$54,569
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Fontheim, E. G.	GSFC/Brace, L. H.	19-Phys Sci, NEC

NAG 5-465 University of Michigan - Ann Arbor 3999
 Dynamic and thermodynamic analyses of the neutral upper atmosphere

<i>Period</i>	<i>Obligations</i>	
10/01/84-11/30/89	FY89: \$278,914	TOTAL: \$1,620,489
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hays, P. B.	GSFC/Bullock, G. D.	19-Phys Sci, NEC
Killeen, T. L.	GSFC/Hoffman, R.	

NAG 5-852 University of Michigan - Ann Arbor 4007
 Mesoscale monitoring of the soil freeze thru boundary from orbital microwave radiometry

<i>Period</i>	<i>Obligations</i>	
10/01/86-12/31/89	FY89: \$50,000	TOTAL: \$287,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Dobson, C.	GSFC/Oseroff, H.	19-Phys Sci, NEC
Ulaby, F.		
Kuhn, W.		

NAG 5-472 University of Michigan - Ann Arbor 4000
 Dynamics Explorer investigations

<i>Period</i>	<i>Obligations</i>	
10/01/84-09/30/90	FY89: \$193,920	TOTAL: \$642,161
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Nagy, A. F.	GSFC/Bullock, G. D.	19-Phys Sci, NEC
	GSFC/Hoffman, R. A.	

NAG 5-1001 University of Michigan - Ann Arbor 4008
 Observations of the unique FE II emitting quasars

<i>Period</i>	<i>Obligations</i>	
09/15/87-09/14/89	FY89:	TOTAL: \$20,200
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Gaskell, C. M.	GSFC/Kondo, Y.	11-Astronomy

NAG 5-480 University of Michigan - Ann Arbor 4001
 Characterization of the microwave extinction properties of vegetation canopies

<i>Period</i>	<i>Obligations</i>	
11/01/84-09/30/89	FY89: \$35,093	TOTAL: \$399,092
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Ulaby, F. T.	GSFC/Oseroff, H.	55-Agriculture Sci

NAG 5-1024 University of Michigan - Ann Arbor 4009
 Shared human telerobot central and time delay

<i>Period</i>	<i>Obligations</i>	
12/01/87-11/30/89	FY89:	TOTAL: \$74,997
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Volz, R. A.	GSFC/Andary, J. F.	39-Env Sci, NEC
Conway, L.		
Walker, M.		

NAG 5-482 University of Michigan - Ann Arbor 4002
 Neutral composition studies of thermospheric processes

<i>Period</i>	<i>Obligations</i>	
10/01/84-09/30/89	FY89: \$50,000	TOTAL: \$512,540
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Carignan, G. R.	GSFC/Bullock, G. D.	19-Phys Sci, NEC
	GSFC/Hoffman, R. A.	

NAG 5-1030 University of Michigan - Ann Arbor 4010
 Ultraviolet observations of the aurora and electroglow emissions torn Neptune

<i>Period</i>	<i>Obligations</i>	
01/01/88-08/31/90	FY89: \$26,400	TOTAL: \$75,134
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Clarke, T. J.	GSFC/West, D.	11-Astronomy

NAG 5-552 University of Michigan - Ann Arbor 4003
 Observations of narrow lined Seyfert galaxies

<i>Period</i>	<i>Obligations</i>	
06/01/85-12/31/88	FY89:	TOTAL: \$35,476
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
MacAlpine, G. M.	GSFC/Kondo, Y.	11-Astronomy
Eastman, R. G.		

NAG 5-1154 University of Michigan - Ann Arbor 4011
 Ultraviolet study of a selected active galaxy Markarian 1126

<i>Period</i>	<i>Obligations</i>	
06/15/89-06/14/90	FY89: \$10,200	TOTAL: \$10,200
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
MacAlpine, G. M.	GSFC/West, D. K.	11-Astronomy

NAG 5-653 University of Michigan - Ann Arbor 4004
 A sounding rocket spectrometer to measure Doppler shifted HLY alpha emission from Jupiter and the interplanetary medium

<i>Period</i>	<i>Obligations</i>	
01/01/89-12/31/89	FY89: \$139,782	TOTAL: \$139,782
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Clarke, J. T.	GSFC/Early, L. J.	13-Physics
	GSFC/Pless, R. H.	

NAG 5-1158 University of Michigan - Ann Arbor 4012
 Antarctic gamma ray and neutron spectrometer balloon flight

<i>Period</i>	<i>Obligations</i>	
07/01/89-06/30/90	FY89: \$40,025	TOTAL: \$40,025
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Sharp, W. E.	GSFC/Trombka, J. I.	19-Phys Sci, NEC
Knoll, G.	GSFC/Floyd, S. R.	

NASA'S UNIVERSITY PROGRAM
MICHIGAN (Continued)

NAG 5-1196 University of Michigan - Ann Arbor 4013
 Infrared astronomy satellite flux ratio mapping of large angular size galaxies and surface photometry of X ray images of clusters of galaxies
Period Obligations
 08/01/89-07/31/90 FY89: \$61,725 TOTAL: \$61,725
Prin. Invest. NASA Tech. Officer CASE Category
 Bothun, G. D. GSFC/West, D. 11-Astronomy

NAG 5-1197 University of Michigan - Ann Arbor 4014
 ADP archival IUE research in outer planet aurora
Period Obligations
 08/01/89-07/31/90 FY89: \$31,692 TOTAL: \$31,692
Prin. Invest. NASA Tech. Officer CASE Category
 Clarke, J. T. GSFC/West, D. 11-Astronomy

NAG 5-1198 University of Michigan - Ann Arbor 4015
 Re analysis of active galaxy spectra from the IUE satellite investigation of important weak emission features
Period Obligations
 08/01/89-07/31/90 FY89: \$25,000 TOTAL: \$25,000
Prin. Invest. NASA Tech. Officer CASE Category
 MacAlpine, G. M. GSFC/West, D. 11-Astronomy

NAG 5-1268 University of Michigan - Ann Arbor 4016
 The distance to the high velocity clouds
Period Obligations
 10/01/89-09/30/90 FY89: \$4,611 TOTAL: \$4,611
Prin. Invest. NASA Tech. Officer CASE Category
 Bregman, J. N. GSFC/West, D. 11-Astronomy

NAG 8-594 University of Michigan - Ann Arbor 4017
 Supernova remnants in the forbidden coronal iron lines 5303 and 6374
Period Obligations
 07/01/86-10/31/87 FY89: TOTAL: \$13,832
Prin. Invest. NASA Tech. Officer CASE Category
 Teske, R. G. MSFC/Potter, P. Y. 11-Astronomy

NAG 8-741 University of Michigan - Ann Arbor 4018
 Visible Doppler lidar
Period Obligations
 08/01/88-07/31/89 FY89: TOTAL: \$150,119
Prin. Invest. NASA Tech. Officer CASE Category
 Hays, P. B. MSFC/Bilbro, J. W. 49-Engr, NEC
 Abreu, V. J. MSFC/Jones, W. D.

NAG 9-139 University of Michigan - Ann Arbor 4019
 Principles of diagrammatic displays of engineered systems
Period Obligations
 04/01/86-09/01/88 FY89: TOTAL: \$148,479
Prin. Invest. NASA Tech. Officer CASE Category
 Kieras, D. JSC/Malin, J. T. 49-Engr, NEC

NAGW 15 University of Michigan - Ann Arbor 4020
 Study in planetary aeronomy
Period Obligations
 12/01/79-08/31/89 FY89: TOTAL: \$557,516
Prin. Invest. NASA Tech. Officer CASE Category
 Cravens, T. E. HQ-EL/Fox, K. 31-Atmos Sci
 HQ-EL/Quaide, W. L.

NAGW 34 University of Michigan - Ann Arbor 4021
 Investigation of the negative geotropic response in geosensitive pulvini of the oat plant (avena sativa)
Period Obligations
 02/01/80-10/31/89 FY89: TOTAL: \$456,403
Prin. Invest. NASA Tech. Officer CASE Category
 Kaufman, P. B. HQ-EB/Halstead, T. W. 51-Biological Sci

NAGW 176 University of Michigan - Ann Arbor 4022
 Interaction of biota and atmosphere: The geological record
Period Obligations
 04/01/81-12/31/89 FY89: \$113,058 TOTAL: \$861,456
Prin. Invest. NASA Tech. Officer CASE Category
 Walker, J. C. HQ-EB/Rummel, J. D. 12-Chemistry
 HQ-EB/Averner, M.

NAGW 312 University of Michigan - Ann Arbor 4023
 Atmospheric effects of auroral precipitation on Jupiter
Period Obligations
 04/01/82-08/31/88 FY89: TOTAL: \$164,043
Prin. Invest. NASA Tech. Officer CASE Category
 Cravens, T. E. HQ-EL/Fox, K. 31-Atmos Sci
 HQ-EL/Quaide, W. L.

NAGW 496 University of Michigan - Ann Arbor 4024
 Visible airglow experiment data analysis
Period Obligations
 06/01/83-11/30/89 FY89: TOTAL: \$358,598
Prin. Invest. NASA Tech. Officer CASE Category
 Hays, P. B. HQ-ES/Mellott, M. M. 13-Physics
 Abreu, V. J. HQ-ES/Parks, G. K.

NAGW 631 University of Michigan - Ann Arbor 4025
 Participation in the Mars 88 mission
Period Obligations
 06/01/84-12/31/89 FY89: TOTAL: \$151,940
Prin. Invest. NASA Tech. Officer CASE Category
 Nagy, A. F. HQ-EL/Brinton, H. C. 31-Atmos Sci
 HQ-EL/Quaide, W. L.

NAGW 733 University of Michigan - Ann Arbor 4026
 Application of radar remote sensing to forest biome discrimination, classification and assessment
Period Obligations
 03/01/85-02/28/90 FY89: \$150,000 TOTAL: \$820,000
Prin. Invest. NASA Tech. Officer CASE Category
 Ulaby, F. T. HQ-EE/Tuyahov, A. J. 39-Env Sci, NEC
 Dobson, M. C. HQ-EE/Estes, J. E.

NAGW 938 University of Michigan - Ann Arbor 4027
 Absolute differential excitation cross section measurements of water vapor by electron impact
Period Obligations
 07/01/86-11/30/89 FY89: \$52,865 TOTAL: \$124,565
Prin. Invest. NASA Tech. Officer CASE Category
 Shyn, T. HQ-EL/Bergstralh, J. T. 31-Atmos Sci
 HQ-EL/Quaide, W. L.

NAGW 990 University of Michigan - Ann Arbor 4028
 Volatile abundance in the atmosphere of Mars
Period Obligations
 11/15/86-11/14/88 FY89: TOTAL: \$17,030
Prin. Invest. NASA Tech. Officer CASE Category
 Atreya, S. K. HQ-EL/Fox, K. 31-Atmos Sci
 HQ-EL/Quaide, W. L.

NASA'S UNIVERSITY PROGRAM
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NAGW 1101 University of Michigan - Ann Arbor 4029
 Extended ecosystems signatures with application to EOS synergism requirements

Period	Obligations	
06/01/87-05/31/89	FY89:	TOTAL: \$529,769
Prin. Invest.	NASA Tech. Officer	CASE Category
Ulaby, F. T.	HQ-EE/Tuyahov, A. J.	39-Env Sci, NEC

NAGW 1158 University of Michigan - Ann Arbor 4030
 Gaseous cometary coronae

Period	Obligations	
10/01/87-09/30/89	FY89:	TOTAL: \$48,185
Prin. Invest.	NASA Tech. Officer	CASE Category
Atreya, S. K.	HQ-EL/Brinton, H. C.	11-Astronomy
	HQ-EL/Rahe, J. H.	

NAGW 1185 University of Michigan - Ann Arbor 4031
 Analysis of the Voyager ultraviolet occultation experiments

Period	Obligations	
10/01/87-09/30/89	FY89:	TOTAL: \$45,004
Prin. Invest.	NASA Tech. Officer	CASE Category
Atreya, S.	HQ-EL/Quaide, W. L.	11-Astronomy
	HQ-EL/Brinton, H. C.	

NAGW 1296 University of Michigan - Ann Arbor 4032
 Superconducting magnet instrument for light isotopes

Period	Obligations	
04/01/88-04/30/89	FY89:	TOTAL: \$100,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Tarle, G.	HQ-ES/Mellott, M. M.	13-Physics
	HQ-ES/Jones, W. V.	

NAGW 1334 University of Michigan - Ann Arbor 4033
 Center for rearmillimeter wave communication and sensing technology

Period	Obligations	
06/01/88-02/28/90	FY89: \$1,974,760	TOTAL: \$2,474,760
Prin. Invest.	NASA Tech. Officer	CASE Category
Ulaby, F. T.	HQ-RS/Hartman, S. C.	49-Engr, NEC

NAGW 1362 University of Michigan - Ann Arbor 4034
 The use of ERS-1 SAR image data in selected forest ecosystem studies

Period	Obligations	
05/01/88-05/31/90	FY89: \$53,000	TOTAL: \$53,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Dobson, M. C.	HQ-EE/Wickland, D. E.	39-Env Sci, NEC
Cimino, J.	HQ-EE/Pieper, T. J.	
Ulaby, F.		

NAGW 1366 University of Michigan - Ann Arbor 4035
 Modeling of cometary atmospheres

Period	Obligations	
07/01/88-11/30/89	FY89: \$40,000	TOTAL: \$97,724
Prin. Invest.	NASA Tech. Officer	CASE Category
Gombosi, T. I.	HQ-EL/Bergstralh, J. T.	11-Astronomy
	HQ-EL/Quaide, W. L.	

NAGW 1367 University of Michigan - Ann Arbor 4036
 Development of physically based models for estimation of above ground tree biomass in old field loblolly pine forests using airborne SAR

Period	Obligations	
07/01/88-06/30/90	FY89: \$43,450	TOTAL: \$86,565
Prin. Invest.	NASA Tech. Officer	CASE Category
Dobson, M. C.	HQ-EE/Wickland, D. E.	39-Env Sci, NEC
Ulaby, F. T.	HQ-EE/Pieper, T. J.	
Christensen, N. L.		

NAGW 1409 University of Michigan - Ann Arbor 4037
 Interdisciplinary scientist probes mission

Period	Obligations	
07/01/88-09/30/89	FY89:	TOTAL: \$34,741
Prin. Invest.	NASA Tech. Officer	CASE Category
Nagy, A. F.	HQ-EL/Brinton, H. C.	13-Physics

NAGW 1442 University of Michigan - Ann Arbor 4038
 Volatile abundances in the atmosphere of Mars

Period	Obligations	
09/15/88-09/14/89	FY89: \$38,300	TOTAL: \$38,300
Prin. Invest.	NASA Tech. Officer	CASE Category
Atreya, S. K.	HQ-EL/Brinton, H. C.	11-Astronomy

NAGW 1504 University of Michigan - Ann Arbor 4039
 Vertical mixing and methane photochemistry in the atmosphere of Uranus analysis of the Voyager ultraviolet occultation experiments

Period	Obligations	
10/01/88-09/30/90	FY89: \$63,276	TOTAL: \$63,276
Prin. Invest.	NASA Tech. Officer	CASE Category
Bishop, J. E.	HQ-EL/Quaide, W. L.	19-Phys Sci, NEC

NAGW 1535 University of Michigan - Ann Arbor 4040
 The effects on the ionosphere of inertia in the high latitude neutral thermosphere

Period	Obligations	
01/01/89-12/31/89	FY89: \$45,106	TOTAL: \$45,106
Prin. Invest.	NASA Tech. Officer	CASE Category
McCormac, F. G.	HQ-ES/Mellott, M. M.	13-Physics
	HQ-ES/Perry, T. W.	

NAGW 1557 University of Michigan - Ann Arbor 4041
 Plasmaspheric flux tube filling via kinetic processes

Period	Obligations	
02/01/89-01/31/90	FY89: \$39,996	TOTAL: \$39,996
Prin. Invest.	NASA Tech. Officer	CASE Category
Bishop, J. E.	HQ-ES/Mellott, M. M.	31-Atmos Sci
	HQ-ES/Perry, T. W.	

NAGW 1600 University of Michigan - Ann Arbor 4042
 Gravitropic response mechanism in cereal grass shoots

Period	Obligations	
02/01/89-01/31/90	FY89: \$55,000	TOTAL: \$55,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Kaufman, P.	HQ-EB/Halstead, T. W.	51-Biological Sci

NAGW 1619 University of Michigan - Ann Arbor 4043
 The ionosphere plasmasphere magnetosphere system

Period	Obligations	
01/01/89-12/31/89	FY89: \$195,000	TOTAL: \$195,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Nagy, A. F.	HQ-ES/Mellott, M. M.	13-Physics
	HQ-ES/Perry, T. W.	

NAGW 1642 University of Michigan - Ann Arbor 4044
 Superconducting magnet instrument for light isotopes

Period	Obligations	
05/01/89-04/30/90	FY89: \$140,000	TOTAL: \$140,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Tarle, G.	HQ-ES/Mellott, M. M.	13-Physics
	HQ-ES/Jones, W. V.	

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NAGW 1744 University of Michigan - Ann Arbor 4045
 Large scale stratospheric dynamics using a numerical model coupled with observations

Period	Obligations	
03/01/89-02/28/90	FY89: \$43,647	TOTAL: \$43,647
Prin. Invest.	NASA Tech. Officer	CASE Category
Smith, A. K.	HQ-EE/McPeters, R. D.	31-Atmos Sci
	HQ-EE/Prather, M. J.	

NAGW 1766 University of Michigan - Ann Arbor 4046
 Analysis of multi wavelength observations of the aurora on Jupiter

Period	Obligations	
04/01/89-03/31/90	FY89: \$55,367	TOTAL: \$55,367
Prin. Invest.	NASA Tech. Officer	CASE Category
Clarke, J. T.	HQ-EL/Bergstralh, J. T.	11-Astronomy

NAGW 1771 University of Michigan - Ann Arbor 4047
 Planetary aeronomy, and coupled cloud physics aeronomy studies

Period	Obligations	
08/01/89-11/30/89	FY89: \$39,133	TOTAL: \$39,133
Prin. Invest.	NASA Tech. Officer	CASE Category
Atreya, S.	HQ-EL/Bergstralh, J. T.	11-Astronomy

NAGW 1783 University of Michigan - Ann Arbor 4048
 Visible arglow experiment data analysis

Period	Obligations	
06/01/89-05/31/90	FY89: \$67,000	TOTAL: \$67,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Abreu, V. J.	HQ-ES/Mellott, M. M.	13-Physics
	HQ-ES/Perry, T. W.	

NAS 1-17008 University of Michigan - Ann Arbor 4049
 High-toughness graphite/epoxy composite material experiment for the long duration exposure facility (LDEF)

Period	Obligations	
07/29/82-11/30/91	FY89:	TOTAL: \$37,394
Prin. Invest.	NASA Tech. Officer	CASE Category
Felbeck, D. K.	LARC/Kinard, W. H.	47-Materials Engr

NAS 1-17820 University of Michigan - Ann Arbor 4050
 Manufacture of the cr-39 and rodyne-p plastic sheets required for test and for flight heavy nuclei collection (HNC) detector stacks on the LDEF mission II

Period	Obligations	
09/28/84-12/31/89	FY89: \$15,000	TOTAL: \$1,059,245
Prin. Invest.	NASA Tech. Officer	CASE Category
Tarle, G.	LARC/Jones, J. L.	11-Astronomy

NAS 1-18290 University of Michigan - Ann Arbor 4051
 Halogen occultation experiment haloe

Period	Obligations	
05/08/86-05/08/93	FY89: \$90,000	TOTAL: \$351,841
Prin. Invest.	NASA Tech. Officer	CASE Category
Drayson, S. R.	LARC/Sullivan, E. M.	31-Atmos Sci
	LARC/Russell, J. M., III	

NAS 3-25366 University of Michigan - Ann Arbor 4052
 Cryogenic tank venting and dumping

Period	Obligations	
09/12/88-09/11/93	FY89: \$100,000	TOTAL: \$175,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Kaviani, M.	LERC/Aydelott, J. C.	49-Engr, NEC

NAS 3-25789 University of Michigan - Ann Arbor 4053
 Novel fiber matrix synthesis approach for high temperature composites

Period	Obligations	
08/21/89-12/06/90	FY89: \$19,619	TOTAL: \$19,619
Prin. Invest.	NASA Tech. Officer	CASE Category
Ghosh, A. K.	LERC/Draper, S.	49-Engr, NEC

NAS 5-25002 University of Michigan - Ann Arbor 4054
 Wind and temperature spectrometer for the Dynamics Explorer spacecraft

Period	Obligations	
03/30/78-09/30/87	FY89:	TOTAL: \$727,779
Prin. Invest.	NASA Tech. Officer	CASE Category
Carignan, G. R.	GSFC/Spencer, N. W.	31-Atmos Sci

NAS 5-25031 University of Michigan - Ann Arbor 4055
 Develop, fabricate, test, and support hardware for the San Marco/wind and temperature experiment

Period	Obligations	
05/05/78-06/30/89	FY89: \$4,894	TOTAL: \$1,607,620
Prin. Invest.	NASA Tech. Officer	CASE Category
Carignan, G. R.	GSFC/Spencer, N. W.	31-Atmos Sci
Maurer, J. M.	GSFC/Adkins, R.	

NAS 5-27751 University of Michigan - Ann Arbor 4056
 High resolution Doppler imager (HRDI) for UARS

Period	Obligations	
10/01/83-07/15/94	FY89: \$5,227,789	TOTAL: \$26,259,881
Prin. Invest.	NASA Tech. Officer	CASE Category
Hays, P.	GSFC/Honeycutt, G.	31-Atmos Sci
	GSFC/Donley, J.	

NAS 5-29344 University of Michigan - Ann Arbor 4057
 Field support for the Galileo probe mass spectrometer (GPMS/electronics)

Period	Obligations	
04/16/86-06/15/91	FY89: \$33,000	TOTAL: \$153,016
Prin. Invest.	NASA Tech. Officer	CASE Category
Carignan, G.	GSFC/Way, S.	31-Atmos Sci

NAS 5-30112 University of Michigan - Ann Arbor 4058
 Implementation study for the neutral gas and ion mass spectrometer electronic system

Period	Obligations	
07/27/87-10/31/90	FY89: \$87,581	TOTAL: \$229,581
Prin. Invest.	NASA Tech. Officer	CASE Category
Carignan, G. R.	GSFC/Way, S. H.	42-Astro Engr

NAS 5-30119 University of Michigan - Ann Arbor 4059
 Scientific interpretation of Galileo probe mass spectrometer data

Period	Obligations	
09/01/87-09/30/94	FY89:	TOTAL: \$25,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Atreya, S. K.	GSFC/Niemann, B.	31-Atmos Sci

NAS 5-30120 University of Michigan - Ann Arbor 4060
 Scientific data analysis or data interpretation of a PMS data

Period	Obligations	
09/01/87-09/30/94	FY89:	TOTAL: \$25,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Donahue, T. M.	GSFC/Niemann, H. B.	31-Atmos Sci

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NAS 5-30336 University of Michigan - Ann Arbor 4061
 Mesosphere lower thermosphere Explorer Lyman mission

Period	Obligations	
06/02/88-07/02/89	FY89: \$144,238	TOTAL: \$289,238
Prin. Invest.	NASA Tech. Officer	CASE Category
Hays, P.	GSFC/Mayer, E.	11-Astronomy

NAS 8-37108 University of Michigan - Ann Arbor 4062
 Research on orbital plasma electrodynamics

Period	Obligations	
04/14/87-10/25/91	FY89: \$7,000	TOTAL: \$16,200
Prin. Invest.	NASA Tech. Officer	CASE Category
Samir, U.	MSFC/Duncan, B.	31-Atmos Sci
	MSFC/Holder, R.	

NASW 4200 University of Michigan - Ann Arbor 4063
 A compact Doppler interferometer for missions in the planetary program instrument definition and development

Period	Obligations	
12/15/86-06/15/89	FY89:	TOTAL: \$160,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Killeen, T. L.	HQ-EL/Quaide, W.	32-Geological Sci
	HQ-EL/Evans, L.	

NASW 4471 University of Michigan - Ann Arbor 4064
 Report on advanced fuel cycles for the micfusion propulsion system

Period	Obligations	
09/28/89-03/28/90	FY89: \$35,651	TOTAL: \$35,651
Prin. Invest.	NASA Tech. Officer	CASE Category
Kammash, T.	HQ-Z/Bekey, I.	49-Engr, NEC

NCA 2-136 University of Michigan - Ann Arbor 4065
 New generation software for applied mechanics problems

Period	Obligations	
06/15/86-06/14/88	FY89:	TOTAL: \$50,245
Prin. Invest.	NASA Tech. Officer	CASE Category
Kikuchi, N.	ARC/Miura, H.	46-Mech Engr

NCA 2-341 University of Michigan - Ann Arbor 4066
 Distributed ADA for the spaceborne VHSIC multiprocessor system

Period	Obligations	
06/01/88-12/31/88	FY89:	TOTAL: \$25,628
Prin. Invest.	NASA Tech. Officer	CASE Category
Volz, R. A.	ARC/Lum, H.	29-Math/Computer, NEC

NCC 2-517 University of Michigan - Ann Arbor 4067
 Fusion of robotics artificial intelligence perception and human systems for advanced space missions

Period	Obligations	
11/01/87-10/31/89	FY89: \$200,017	TOTAL: \$533,495
Prin. Invest.	NASA Tech. Officer	CASE Category
Volz, R. A.	ARC/Friedland, P. E.	22-Computer Science
Laird, J.	ARC/Sims, M.	
Conway, L.		

NCC 2-573 University of Michigan - Ann Arbor 4068
 Autonomous visual navigation system for rotorcrafts

Period	Obligations	
10/01/88-10/31/89	FY89: \$77,333	TOTAL: \$77,333
Prin. Invest.	NASA Tech. Officer	CASE Category
Jain, R.	ARC/Sridhar, B.	41-Aero Engr
	ARC/Cheng, V. H.	

NCC 3-76 University of Michigan - Ann Arbor 4069
 Development of tough Ni Al based alloys and composite materials for high temperature applications

Period	Obligations	
01/01/87-12/31/89	FY89: \$15,000	TOTAL: \$112,610
Prin. Invest.	NASA Tech. Officer	CASE Category
Gibala, R.	LERC/Noebe, R. D.	47-Materials Engr

NCC 3-130 University of Michigan - Ann Arbor 4070
 Electro optic network analysis of GAASMMIC's and high TC superconducting transmission lines

Period	Obligations	
01/23/89-12/31/89	FY89: \$70,000	TOTAL: \$70,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Mourou, G. M.	LERC/Bhasin, K. B.	45-Elec Engr
	LERC/Leonard, R. F.	

NCC 8-1 University of Michigan - Ann Arbor 4071
 Comet rendezvous asteroid fly by mission

Period	Obligations	
05/05/87-06/19/89	FY89:	TOTAL: \$12,469
Prin. Invest.	NASA Tech. Officer	CASE Category
Gombosi, T. I.	MSFC/Moore, T. E.	41-Aero Engr
	MSFC/Fields, S. H.	

NGR 23-005-320 University of Michigan - Ann Arbor 4072
 The expansion of a collision less plasma into a vacuum

Period	Obligations	
01/29/69-09/30/89	FY89: \$10,000	TOTAL: \$1,010,483
Prin. Invest.	NASA Tech. Officer	CASE Category
Samir, U.	HQ-ES/Mellott, M. M.	13-Physics
	HQ-ES/Eastman, T. E.	

NGR 23-005-360 University of Michigan - Ann Arbor 4073
 A program in aeronomy

Period	Obligations	
12/29/69-01/31/90	FY89: \$212,563	TOTAL: \$3,528,584
Prin. Invest.	NASA Tech. Officer	CASE Category
Sharp, W. E.	GSFC/Early, L. J.	13-Physics
	GSFC/Pless, R. H.	

NGT 00-050-010 University of Michigan - Ann Arbor 4074
 NASA graduate student researchers program

Period	Obligations	
07/01/86-08/31/88	FY89:	TOTAL: \$34,532
Prin. Invest.	NASA Tech. Officer	CASE Category
Sharn, W. E.	HQ-LE/Owens, F. C.	31-Atmos Sci

NGT 00-050-047 University of Michigan - Ann Arbor 4075
 NASA graduate student researchers program

Period	Obligations	
09/01/86-08/31/89	FY89:	TOTAL: \$53,100
Prin. Invest.	NASA Tech. Officer	CASE Category
Cravens, T.	HQ-XE/Owens, F. C.	31-Atmos Sci

NGT 00-050-095 University of Michigan - Ann Arbor 4076
 NASA graduate student researchers program

Period	Obligations	
07/01/86-06/30/89	FY89:	TOTAL: \$54,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Fogler, H. S.	HQ-LE/Owens, F. C.	43-Chem Engr

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NGT 00-050-110 University of Michigan - Ann Arbor 4077
 NASA graduate student researchers program
Period Obligations
 09/01/86-08/31/88 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
 Irani, K. B. HQ-XE/Owens, F. C. 99-Multi-Discip

NGT 00-050-190 University of Michigan - Ann Arbor 4078
 NASA graduate student researchers program
Period Obligations
 06/01/87-05/31/88 FY89: TOTAL: \$13,498
Prin. Invest. NASA Tech. Officer CASE Category
 Atreya, S. K. HQ-XE/Owens, F. C. 31-Atmos Sci

NGT 00-050-193 University of Michigan - Ann Arbor 4079
 NASA graduate student researchers program
Period Obligations
 06/01/87-05/31/90 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
 Hays, P. B. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-201 University of Michigan - Ann Arbor 4080
 NASA graduate student researchers program
Period Obligations
 06/01/87-07/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
 Atreya, S. K. HQ-XE/Owens, F. C. 31-Atmos Sci

NGT 00-050-330 University of Michigan - Ann Arbor 4081
 NASA graduate student researchers program
Period Obligations
 08/01/88-07/31/90 FY89: TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
 Ulaby, F. T. HQ-XE/Owens, F. C. 45-Elec Engr

NGT 00-050-368 University of Michigan - Ann Arbor 4082
 NASA graduate student researchers program
Period Obligations
 09/01/88-08/31/90 FY89: TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
 Gombosi, T. I. HQ-XE/Owens, F. C. 13-Physics

NGT 00-070-004 University of Michigan - Ann Arbor 4083
 NASA graduate student researchers underrepresented minority focus program
Period Obligations
 12/15/86-06/15/89 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
 Kaufman, P. B. HQ-XE/Owens, F. C. 51-Biological Sci

NGT 00-070-040 University of Michigan - Ann Arbor 4084
 Graduate student researchers underrepresented minority focus program
Period Obligations
 07/01/87-06/30/88 FY89: TOTAL: \$14,657
Prin. Invest. NASA Tech. Officer CASE Category
 Donahue, T. M. HQ-XE/Owens, F. C. 31-Atmos Sci

NGT 00-070-096 University of Michigan - Ann Arbor 4085
 Graduate student researchers underrepresented minority focus program
Period Obligations
 09/01/88-08/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
 Gombosi, T. I. HQ-XE/Owens, F. C. 31-Atmos Sci

NGT 00-070-115 University of Michigan - Ann Arbor 4086
 NASA graduate student researchers underrepresented minority focus program
Period Obligations
 01/01/89-12/31/89 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
 Taylor, J. E. HQ-XE/Counts, J. 41-Aero Engr

NGT 00-070-120 University of Michigan - Ann Arbor 4087
 NASA graduate student researchers underrepresented minority focus program
Period Obligations
 08/01/89-07/31/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
 Walker, J. C. HQ-XE/Owens, F. C. 39-Env Sci, NEC

NGT 23-005-801 University of Michigan - Ann Arbor 4088
 NASA graduate student researchers program
Period Obligations
 05/15/84-07/31/88 FY89: TOTAL: \$66,495
Prin. Invest. NASA Tech. Officer CASE Category
 Shin, K. G. HQ-LB/Owens, F. C. 41-Aero Engr

NGT 23-005-802 University of Michigan - Ann Arbor 4089
 NASA graduate student researchers program
Period Obligations
 06/01/84-12/31/89 FY89: \$100,000 TOTAL: \$1,010,857
Prin. Invest. NASA Tech. Officer CASE Category
 Weintraub, D. J. HQ-LB/Owens, F. C. 49-Engr, NEC

NSG 1607 University of Michigan - Ann Arbor 4090
 Material property characteristics of cord rubber composites
Period Obligations
 09/01/79-04/30/89 FY89: TOTAL: \$424,349
Prin. Invest. NASA Tech. Officer CASE Category
 Clark, S. K. LARC/Perez, S. E. 41-Aero Engr
 LARC/Howell, W. E.

NSG 7404 University of Michigan - Ann Arbor 4091
 A program for research in planetary atmospheres
Period Obligations
 10/01/77-07/31/90 FY89: TOTAL: \$1,046,291
Prin. Invest. NASA Tech. Officer CASE Category
 Atreya, S. K. HQ-EL/Fox, K. 31-Atmos Sci
 HQ-EL/Quaide, W. L.

NAG 1-460 Wayne State University 4092
 Analysis of the leading edge effects on the boundary layer transition
Period Obligations
 03/01/84-05/31/90 FY89: TOTAL: \$53,516
Prin. Invest. NASA Tech. Officer CASE Category
 Chow, P. LARC/Maestrello, L. 41-Aero Engr

NAG 2-404 Wayne State University 4093
 Mechanisms of vestibular ion transport
Period Obligations
 07/01/86-12/31/89 FY89: \$38,800 TOTAL: \$139,110
Prin. Invest. NASA Tech. Officer CASE Category
 Kerr, T. P. ARC/Ross, M. D. 51-Biological Sci
 Drescher, D. G. ARC/Oyama, J.

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NAG 3-833 Wayne State University 4094
 Radiation resistance studies of amorphous silicon alloy photovoltaic materials

Period	Obligations	
11/05/87-11/04/89	FY89: \$39,998	TOTAL: \$79,958
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Woodyard, J. R.	LERC/Brinker, D. J.	45-Elec Engr

NAG 3-918 Wayne State University 4095
 Novel concepts of power transmission gears

Period	Obligations	
07/01/88-06/30/90	FY89: \$43,520	TOTAL: \$82,950
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Rivin, E. I.	LERC/Chaiko, L. I.	46-Mech Engr
	LERC/Bill, R. C.	

NAG 3-1025 Western Michigan University 4096
 NASA GSOSTATS enhancement project

Period	Obligations	
03/13/89-12/12/89	FY89: \$57,303	TOTAL: \$57,303
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Kerstetter, M. C.	LERC/Hollansworth, J. E.	22-Computer Science
Motzkin, D.		

NCC 2-493 Western Michigan University 4097
 Development of a light weight self contained flight instrumentation and data acquisition system

Period	Obligations	
09/01/87-08/31/90	FY89: \$30,846	TOTAL: \$153,485
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hoadley, A. W.	ARC/Bogue, R. K.	46-Mech Engr

MINNESOTA

NAGW 1567 Augsburg College 4098
 A correlative investigation of the propagation of ULF wave power through the dayside magnetosphere

Period	Obligations	
01/01/89-12/31/89	FY89: \$40,000	TOTAL: \$40,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Engelbreton, M. J.	HQ-ES/Mellott, M. M.	13-Physics
	HQ-ES/Perry, T. W.	

NAG 1-808 Univ of Minnesota - Minneapolis-St Paul 4099
 Development of an enhanced thermal structural methodology via hybrid computational schemes and adaptive finite element formations

Period	Obligations	
08/01/87-06/15/90	FY89: \$97,775	TOTAL: \$278,482
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Tamma, K. K.	LARC/Scotti, S.	46-Mech Engr
	LARC/Camarda, C. J.	

NAG 1-821 Univ of Minnesota - Minneapolis-St Paul 4100
 Application of nonlinear feedback control theory to supermaneuverable aircraft

Period	Obligations	
09/21/87-09/20/89	FY89:	TOTAL: \$85,719
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Garrard, W. L.	LARC/Bacon, B. J.	41-Aero Engr
Enns, D. F.	LARC/Ostroff, A. J.	

NAG 3-598 Univ of Minnesota - Minneapolis-St Paul 4101
 Investigation of heat transfer and hydrodynamics in oscillating flows with application to Stirling engine components

Period	Obligations	
01/22/85-02/28/90	FY89: \$54,000	TOTAL: \$198,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Simon, T. W.	LERC/Dudenhoefer, J.	13-Physics
Seume, J.	LERC/Tew, R.	

NAG 3-693 Univ of Minnesota - Minneapolis-St Paul 4102
 2D and 3D sterling machine simulation using experimentally generated reversing flow correlations

Period	Obligations	
01/20/86-06/18/89	FY89: \$17,707	TOTAL: \$75,925
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Goldberg, L. F.	LERC/Tew, R. C.	49-Engr, NEC

NAG 3-881 Univ of Minnesota - Minneapolis-St Paul 4103
 Boundary layer transition on curved surfaces

Period	Obligations	
03/01/88-12/31/90	FY89: \$25,000	TOTAL: \$39,704
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Simon, T. W.	LERC/O'Brien, J. E.	46-Mech Engr

NAG 3-1024 Univ of Minnesota - Minneapolis-St Paul 4104
 Numerical prediction of the fluid flow and heat transfer

Period	Obligations	
03/01/89-02/28/90	FY89: \$32,000	TOTAL: \$32,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Patankar, S. V.	LERC/Tew, R. C.	49-Engr, NEC
	LERC/Dudenhoefer, J. E.	

NAG 5-529 Univ of Minnesota - Minneapolis-St Paul 4105
 Dynamics Explorer magnetometer experiment

Period	Obligations	
04/01/85-09/30/90	FY89: \$33,548	TOTAL: \$168,436
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Cahill, L. J.	GSFC/Bullock, G. D.	19-Phys Sci, NEC
	GSFC/Hoffman, R. A.	

NAG 5-770 Univ of Minnesota - Minneapolis-St Paul 4106
 Geodynamical investigation of month rheology over short and intermediate timescales

Period	Obligations	
04/01/86-12/15/89	FY89:	TOTAL: \$206,318
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Yuen, D. A.	GSFC/Welker, J. E.	32-Geological Sci

NAG 5-983 Univ of Minnesota - Minneapolis-St Paul 4107
 Coordinated radio electron and waves experiment

Period	Obligations	
09/01/87-06/30/90	FY89:	TOTAL: \$45,770
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Kellogg, P. J.	GSFC/Scudder, J. D.	19-Phys Sci, NEC
	GSFC/Ogilvie, K. W.	

NAG 5-1009 Univ of Minnesota - Minneapolis-St Paul 4108
 Special characterization of Northern forests

Period	Obligations	
09/15/87-12/31/88	FY89:	TOTAL: \$15,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Bauer, M. E.	GSFC/Ranson, K. J.	39-Env Sci, NEC

**NASA'S UNIVERSITY PROGRAM
MINNESOTA (Continued)**

NAG 5-1185 Univ of Minnesota - Minneapolis-St Paul 4109
Image analysis of infrared astronomy satellite pointed observations of evolved stellar systems

Period	Obligations	
08/01/89-07/31/90	FY89: \$30,743	TOTAL: \$30,743
Prin. Invest.	NASA Tech. Officer	CASE Category
Gehrz, R. D.	GSFC/West, D.	11-Astronomy

NAG 5-1281 Univ of Minnesota - Minneapolis-St Paul 4110
The carbon abundance in a selected super metal poor galaxy

Period	Obligations	
10/01/89-09/30/90	FY89: \$11,400	TOTAL: \$11,400
Prin. Invest.	NASA Tech. Officer	CASE Category
Skillman, E. D.	GSFC/West, D.	11-Astronomy

NAG 6-11 Univ of Minnesota - Minneapolis-St Paul 4111
Investigation of auroral electrodynamics and argon release for controlled studies (ARCS)

Period	Obligations	
04/23/81-07/22/90	FY89: \$25,183	TOTAL: \$537,740
Prin. Invest.	NASA Tech. Officer	CASE Category
Cahill, L. J.	GSFC/Early, L. J.	13-Physics
Kintner, P. M.	GSFC/Pless, R. H.	

NAG 8-500 Univ of Minnesota - Minneapolis-St Paul 4112
Program of analysis of data obtained by the HEAO 3 spacecraft

Period	Obligations	
10/01/84-09/30/89	FY89: \$95,000	TOTAL: \$449,434
Prin. Invest.	NASA Tech. Officer	CASE Category
Waddington, C. J.	MSFC/Havrisik, D.	11-Astronomy

NAG 9-60 Univ of Minnesota - Minneapolis-St Paul 4113
Rare gas studies on lunar, meteoritic, and selected terrestrial materials

Period	Obligations	
02/01/83-02/01/90	FY89: \$163,739	TOTAL: \$1,067,737
Prin. Invest.	NASA Tech. Officer	CASE Category
Pepin, R. O.	JSC/Browne, I. D.	32-Geological Sci

NAG 9-110 Univ of Minnesota - Minneapolis-St Paul 4114
Anomalous isotopic abundances in extraterrestrial material

Period	Obligations	
04/23/85-04/01/90	FY89: \$41,636	TOTAL: \$194,636
Prin. Invest.	NASA Tech. Officer	CASE Category
Nier, A. O.	JSC/Browne, I. D.	47-Materials Engr

NAGW 505 Univ of Minnesota - Minneapolis-St Paul 4115
Development of a pyrolysis experiment

Period	Obligations	
10/01/83-07/31/89	FY89:	TOTAL: \$165,160
Prin. Invest.	NASA Tech. Officer	CASE Category
Mauersberger, K.	HQ-EL/Evans, L. G.	11-Astronomy
Nier, A. O.	HQ-EL/Vescelus, F.	

NAGW 800 Univ of Minnesota - Minneapolis-St Paul 4116
Kinetics and mechanisms of stratospheric chlorine release from chlorofluoromethyl species

Period	Obligations	
09/01/85-01/31/90	FY89: \$81,992	TOTAL: \$347,211
Prin. Invest.	NASA Tech. Officer	CASE Category
Carr, R. W.	HQ-EE/Kurylo, M. J.	31-Atmos Sci
	HQ-EE/Hampson, R. F.	

NAGW 1008 Univ of Minnesota - Minneapolis-St Paul 4117
Convection algorithms for multiple processing super computers and graphical interactive environments on workstations

Period	Obligations	
02/01/87-07/31/89	FY89:	TOTAL: \$72,558
Prin. Invest.	NASA Tech. Officer	CASE Category
Yuen, D. A.	HQ-E/Rosendhal, J. D.	32-Geological Sci
	HQ-EP/Konkel, R. M.	

NAGW 1371 Univ of Minnesota - Minneapolis-St Paul 4118
The origin and evolution of terrestrial planet atmospheres noble gases nitrogen and carbon

Period	Obligations	
03/16/88-03/15/89	FY89:	TOTAL: \$29,860
Prin. Invest.	NASA Tech. Officer	CASE Category
Pepin, R. O.	HQ-EL/Fox, K.	31-Atmos Sci
	HQ-EL/Quade, W. L.	

NAGW 1431 Univ of Minnesota - Minneapolis-St Paul 4119
Satellite inventory of Minnesota forest resources

Period	Obligations	
09/01/88-12/31/89	FY89: \$152,771	TOTAL: \$190,509
Prin. Invest.	NASA Tech. Officer	CASE Category
Bauer, M. E.	HQ-EE/Huntress, W.	39-Env Sci, NEC
	HQ-EE/Tilford, S. G.	

NAGW 1584 Univ of Minnesota - Minneapolis-St Paul 4120
Convection algorithm for multi processing supercomputers chaotic dynamics and graphical interactive environments on workstations

Period	Obligations	
03/01/89-02/28/90	FY89: \$78,543	TOTAL: \$78,543
Prin. Invest.	NASA Tech. Officer	CASE Category
Yuen, D. A.	HQ-E/Alexander, J. K.	22-Computer Science
	HQ-E/Holland, D. A.	

NAS 5-28574 Univ of Minnesota - Minneapolis-St Paul 4121
Design and develop a portion of radio and plasma wave instrument selected to fly on the open wind spacecraft

Period	Obligations	
09/20/84-12/31/88	FY89: \$2,186	TOTAL: \$342,144
Prin. Invest.	NASA Tech. Officer	CASE Category
Kellogg, P. J.	GSFC/Kaiser, M. L.	45-Elec Engr
	GSFC/Stone, R. G.	

NAS 5-29313 Univ of Minnesota - Minneapolis-St Paul 4122
Support services for uflypres std instrument

Period	Obligations	
08/01/86-11/30/90	FY89: \$217,664	TOTAL: \$583,341
Prin. Invest.	NASA Tech. Officer	CASE Category
Kellogg, P.	GSFC/Klein, B.	31-Atmos Sci

NAS 5-30544 Univ of Minnesota - Minneapolis-St Paul 4123
Design and develop radio and plasma wave instrument for OPEN spacecraft

Period	Obligations	
03/02/89-12/02/89	FY89: \$443,792	TOTAL: \$443,792
Prin. Invest.	NASA Tech. Officer	CASE Category
Kellogg, P.	GSFC/Kaiser, M.	41-Aero Engr

NAS 9-17892 Univ of Minnesota - Minneapolis-St Paul 4124
Development of a flow field simulator

Period	Obligations	
09/01/87-07/15/90	FY89: \$17,000	TOTAL: \$65,300
Prin. Invest.	NASA Tech. Officer	CASE Category
Tezduyar, T. E.	JSC/Goodrich, W.	41-Aero Engr

NASA'S UNIVERSITY PROGRAM MINNESOTA (Continued)

NASW 4215 Univ of Minnesota - Minneapolis-St Paul 4125
Mass spectrometer techniques

Period	FY89:	Obligations	TOTAL:
11/01/86-09/30/89	FY89:		\$152,360
Prin. Invest.	NASA Tech. Officer	CASE Category	
Nier, A. O.	HQ-EL/Mahaffy, P.	12-Chemistry	
	HQ-EL/Gold, R. E.		

NCA 2-329 Univ of Minnesota - Minneapolis-St Paul 4126
Aerodynamics of windshear using computational fluid dynamics

Period	FY89:	Obligations	TOTAL:
07/16/88-07/15/90	FY89: \$52,230		\$62,502
Prin. Invest.	NASA Tech. Officer	CASE Category	
Lundgren, T. S.	ARC/Moin, P.	41-Aero Engr	

NCC 2-497 Univ of Minnesota - Minneapolis-St Paul 4127
Automatic techniques for reconfiguring a multiple processor computing network

Period	FY89:	Obligations	TOTAL:
09/01/87-09/30/88	FY89:		\$99,998
Prin. Invest.	NASA Tech. Officer	CASE Category	
Slagle, J. R.	ARC/Lum, H.	45-Elec Engr	

NCC 2-526 Univ of Minnesota - Minneapolis-St Paul 4128
The quantum dynamics of electronically nonadiabatic chemical reactions

Period	FY89:	Obligations	TOTAL:
10/01/87-09/30/89	FY89: \$46,000		\$86,000
Prin. Invest.	NASA Tech. Officer	CASE Category	
Truhlar, D. G.	ARC/Cooper, D. M.	12-Chemistry	

NGR 24-005-050 Univ of Minnesota - Minneapolis-St Paul 4129
Measurement of the gamma ray flux of various celestial point sources from high altitude balloons

Period	FY89:	Obligations	TOTAL:
04/21/65-11/30/89	FY89: \$203,027		\$2,465,978
Prin. Invest.	NASA Tech. Officer	CASE Category	
Waddington, C. J.	HQ-ES/Mellott, M. M.	11-Astronomy	
	HQ-ES/Jones, W. V.		

NGT 00-050-009 Univ of Minnesota - Minneapolis-St Paul 4130
NASA graduate student researchers program

Period	FY89:	Obligations	TOTAL:
06/15/86-06/14/89	FY89:		\$54,000
Prin. Invest.	NASA Tech. Officer	CASE Category	
Winckler, J. R.	HQ-LE/Owens, F. C.	13-Physics	

NGT 00-050-100 Univ of Minnesota - Minneapolis-St Paul 4131
NASA graduate student researchers program

Period	FY89:	Obligations	TOTAL:
06/01/86-09/30/88	FY89:		\$36,000
Prin. Invest.	NASA Tech. Officer	CASE Category	
Bauer, M. E.	HQ-LE/Owens, F. C.	39-Env Sci, NEC	

NGT 00-050-200 Univ of Minnesota - Minneapolis-St Paul 4132
NASA graduate student researchers program

Period	FY89:	Obligations	TOTAL:
06/15/87-06/14/90	FY89: \$18,000		\$54,000
Prin. Invest.	NASA Tech. Officer	CASE Category	
Yuen, D. A.	HQ-XE/Owens, F. C.	32-Geological Sci	

NGT 00-050-238 Univ of Minnesota - Minneapolis-St Paul 4133
NASA graduate student researchers program

Period	FY89:	Obligations	TOTAL:
09/01/87-08/31/90	FY89: \$18,000		\$51,197
Prin. Invest.	NASA Tech. Officer	CASE Category	
Mauersberger, K.	HQ-XE/Owens, F. C.	13-Physics	

NGT 00-050-258 Univ of Minnesota - Minneapolis-St Paul 4134
NASA graduate student researchers program

Period	FY89:	Obligations	TOTAL:
08/01/88-07/31/90	FY89: \$18,000		\$36,000
Prin. Invest.	NASA Tech. Officer	CASE Category	
Gorham, E.	HQ-XE/Owens, F. C.	61-Biol Aspects	

NGT 00-050-421 Univ of Minnesota - Minneapolis-St Paul 4135
NASA graduate student researchers program

Period	FY89:	Obligations	TOTAL:
07/01/89-06/30/90	FY89: \$18,000		\$18,000
Prin. Invest.	NASA Tech. Officer	CASE Category	
Banerjee, S.	HQ-XE/Owens, F. C.	19-Phys Sci, NEC	

NGT 00-050-478 Univ of Minnesota - Minneapolis-St Paul 4136
NASA graduate student researchers program

Period	FY89:	Obligations	TOTAL:
07/01/89-06/30/90	FY89: \$18,000		\$18,000
Prin. Invest.	NASA Tech. Officer	CASE Category	
Almlof, J.	HQ-XE/Owens, F. C.	13-Physics	

NGT 24-001-801 Univ of Minnesota - Minneapolis-St Paul 4137
NASA graduate student researchers program

Period	FY89:	Obligations	TOTAL:
06/01/85-04/30/88	FY89:		\$33,524
Prin. Invest.	NASA Tech. Officer	CASE Category	
Pepin, R. O.	HQ-LE/Owens, F. C.	13-Physics	

NGT 25-001-800 Univ of Minnesota - Minneapolis-St Paul 4138
NASA graduate student researchers program

Period	FY89:	Obligations	TOTAL:
09/15/85-11/15/87	FY89:		\$18,000
Prin. Invest.	NASA Tech. Officer	CASE Category	
Alexander, E. C., Jr.	HQ-LE/Owens, F. C.	32-Geological Sci	

NSG 1431 Univ of Minnesota - Minneapolis-St Paul 4139
Neutral constituent measurements in the stratosphere

Period	FY89:	Obligations	TOTAL:
07/01/77-03/31/90	FY89: \$232,735		\$1,880,935
Prin. Invest.	NASA Tech. Officer	CASE Category	
Mauersberger, K.	LARC/Beswick, A. G.	31-Atmos Sci	
Nier, A. O.			

NSG 5088 Univ of Minnesota - Minneapolis-St Paul 4140
Magnetospheric physics phenomena using sounding rockets

Period	FY89:	Obligations	TOTAL:
11/01/75-12/31/89	FY89: \$112,075		\$2,386,773
Prin. Invest.	NASA Tech. Officer	CASE Category	
Winckler, J. R.	GSFC/Early, L. J.	13-Physics	
	GSFC/Pless, R. H.		

NSG 5373 Univ of Minnesota - Minneapolis-St Paul 4141
Experiments employing a rocket-borne electron accelerator

Period	FY89:	Obligations	TOTAL:
06/15/79-04/30/90	FY89: \$314,500		\$1,079,918
Prin. Invest.	NASA Tech. Officer	CASE Category	
Kellogg, P. J.	GSFC/Early, L. J.	13-Physics	
Bernstein, W.	GSFC/Pless, R. H.		

NASA'S UNIVERSITY PROGRAM MISSISSIPPI

MISSISSIPPI

NAG 1-860 Jackson State University 4142
End effector joint conjugates for robotic assembly of large truss structures in space

Period	Obligations	
09/01/88-08/31/89	FY89:	TOTAL: \$70,744
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Brewer, W. V.	LARC/Rhodes, M. D.	46-Mech Engr
Polk, S. L.	LARC/Wise, M. A.	
Rasis, E. P.		

NAGW 1759 Jackson State University 4143
Parameters relating to the testing and operation of advanced spacecraft and instruments

Period	Obligations	
09/01/89-08/31/90	FY89: \$50,000	TOTAL: \$50,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Lupton, W. L.	HQ-U/Margolis, M.	22-Computer Science

NCC13-1 Jackson State University 4144
Research relative to the spatial data management and analysis systems

Period	Obligations	
02/03/87-11/30/89	FY89: \$420,026	TOTAL: \$814,881
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Leflore, R. M.	SSC/Galle, R. A.	22-Computer Science

NAG 1-226 Mississippi State University 4145
Transonic viscous-inviscid interaction using Euler and inverse boundary-layer equations

Period	Obligations	
11/01/81-12/31/89	FY89: \$45,000	TOTAL: \$302,334
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Whitfield, D. L.	LARC/Thames, F. C.	41-Aero Engr
	LARC/Edwards, J. W.	

NAG 1-1061 Mississippi State University 4146
Enhancement of surface definition and gridding in the eagle code

Period	Obligations	
10/01/89-09/30/90	FY89: \$25,000	TOTAL: \$25,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Thompson, J. F.	LARC/Weiluenster, K. J.	49-Engr, NEC

NAG 3-767 Mississippi State University 4147
3 D unsteady Euler solutions for interacting blade rows

Period	Obligations	
12/15/86-12/13/89	FY89: \$50,000	TOTAL: \$140,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Whitfield, D. L.	LERC/Hoyniak, D.	41-Aero Engr
	LERC/Huff, D. L.	

NAG 3-869 Mississippi State University 4148
Computation of rotor stator interactions using the Navier-Stokes equations

Period	Obligations	
01/20/88-01/19/90	FY89: \$55,000	TOTAL: \$105,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Whitfield, D.	LERC/Sanz, J. M.	41-Aero Engr

NAG 3-983 Mississippi State University 4149
Computational fluid dynamics for aerolastic analysis

Period	Obligations	
01/10/89-01/09/90	FY89: \$48,000	TOTAL: \$48,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Whitfield, D. L.	LERC/Stefko, G. L.	41-Aero Engr
Swafford, T.	LERC/Kiraly, L. J.	

NAG 3-1073 Mississippi State University 4150
Parallel applications research for computational fluid dynamics (CFD) problems

Period	Obligations	
10/01/89-07/31/90	FY89: \$80,000	TOTAL: \$80,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Trotter, J. D.	LERC/Blech, R. A.	29-Math/Computer, NEC
Owens, J. K.	LERC/Sznch, J. R.	
Harden, J. C.		

NAG 8-104 Mississippi State University 4151
Error correcting techniques for OMV digitized data capabilities

Period	Obligations	
05/12/88-09/12/90	FY89: \$46,145	TOTAL: \$82,140
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Ingels, F. M.	MSFC/Thomas, H. L.	45-Elec Engr

NAG 8-545 Mississippi State University 4152
Standardization of the carbon-carbon and carbon-phenolic materials and processes

Period	Obligations	
08/27/85-01/27/90	FY89: \$32,784	TOTAL: \$430,757
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hall, W. B.	MSFC/Fikes, L. A.	47-Materials Engr
	MSFC/Stucker, M. L.	

NAG13-6 Mississippi State University 4153
Use of halophytic plants to decrease the rate of decertification of irrigated agricultural lands

Period	Obligations	
03/31/88-11/30/88	FY89:	TOTAL: \$10,528
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Esher, R. J.	SSC/Wolverton, B. C.	39-Env Sci, NEC

NAG13-8 Mississippi State University 4154
Use of salt tolerant plants for removal of minerals and toxic chemicals from water supplies

Period	Obligations	
07/26/88-07/25/89	FY89:	TOTAL: \$35,047
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Esher, R. J.	SSC/Wolverton, B. C.	39-Env Sci, NEC

NAS 3-23901 Mississippi State University 4155
Scientific support for an orbiter experiment on solid surface combustion-previously awarded to Univ of KY on 12-19-84-transferred to Miss. State Univ as of 9-1-88

Period	Obligations	
12/19/84-04/03/93	FY89: \$94,000	TOTAL: \$390,638
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Altenkirch, R. A.	LERC/Olson, S. L.	49-Engr, NEC

NAS 8-36044 Mississippi State University 4156
Analysis of space telescope data collection system

Period	Obligations	
08/03/84-08/31/90	FY89:	TOTAL: \$97,631
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Ingels, F. M.	MSFC/Parker, G. A.	45-Elec Engr
	MSFC/Schrimsher, H. E.	

NASA'S UNIVERSITY PROGRAM **MISSISSIPPI (Continued)**

NAS 8-36717 **Mississippi State University** **4157**
 Spacelab system analysis
Period *Obligations*
 07/30/86-11/30/89 FY89: \$82,990 TOTAL: \$241,718
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Ingels, F. M. MSFC/Parker, G. 29-Math/Computer, NEC
 Owens, J. K. MSFC/Frankford, M.

NAS 8-36949 **Mississippi State University** **4158**
 Adaptive computational methods for high Reynolds number internal flows in advanced propulsion systems
Period *Obligations*
 03/24/89-03/24/92 FY89: \$225,000 TOTAL: \$225,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Thompson, J. F. MSFC/Mc connaughey, P. K. 49-Engr, NEC
 MSFC/Mc connaughey, H. V.

NAS 9-17319 **Mississippi State University** **4159**
 Develop a microcomputer application to bioprocessing
Period *Obligations*
 02/01/85-02/01/90 FY89: \$700 TOTAL: \$76,451
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Rundell, R. JSC/Morrison, D. 59-Life Sci, NEC

NAS13-321 **Mississippi State University** **4160**
 Methods for disposal of waste propellants residuals and incomplete combustion products from ignition of the advanced solid rocket motor
Period *Obligations*
 10/01/87-04/01/88 FY89: \$719 TOTAL: \$40,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Crochet, R. A. SSC/McCaleb, R. C. 32-Geological Sci
 Esher, R. J.
 Hill, D. O.

NCA 2-244 **Mississippi State University** **4161**
 A study of a three dimensional cavity in transonic flow
Period *Obligations*
 08/16/87-08/15/89 FY89: TOTAL: \$40,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Koenig, K. ARC/Strawa, A. W. 41-Aero Engr

NGT 00-050-398 **Mississippi State University** **4162**
 NASA graduate student researchers program
Period *Obligations*
 06/01/89-03/31/90 FY89: \$17,993 TOTAL: \$17,993
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Thompson, J. F. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 00-050-530 **Mississippi State University** **4163**
 NASA graduate student researchers program
Period *Obligations*
 06/20/89-06/19/90 FY89: \$17,967 TOTAL: \$17,967
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Hall, K. R. HQ-XE/Owens, F. C. 41-Aero Engr

NSG 1577 **Mississippi State University** **4164**
 Transformation of two and three dimensional regions by elliptic systems
Period *Obligations*
 11/15/78-03/31/90 FY89: \$32,320 TOTAL: \$321,737
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Thompson, J. F. LARC/Smith, R. E., Jr. 21-Mathematics
 Mastin, C. W. LARC/Shoosmith, J. N.

NAG 1-1000 **University of Mississippi - University** **4165**
 Comparison of low frequency ground impedance measurement methods
Period *Obligations*
 05/01/89-12/31/89 FY89: \$10,368 TOTAL: \$10,368
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Raspet, R. LARC/Willshire, W. L. 13-Physics
 LARC/Chestnutt, D.

NAG 8-648 **University of Mississippi - University** **4166**
 Electric field measurements inside COHMEY thunderstorms
Period *Obligations*
 09/01/87-09/01/90 FY89: \$24,035 TOTAL: \$46,729
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Marshall, T. C. MSFC/Blakeslee, R. 19-Phys Sci, NEC

NGT 00-050-365 **University of Mississippi - University** **4167**
 NASA graduate student researchers program
Period *Obligations*
 08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Hackett, R. M. HQ-XE/Owens, F. C. 49-Engr, NEC

NAG 1-800 **University of Southern Mississippi** **4168**
 Viewing resolution as a problem in detection the application of receiver operating characteristics to determine efficacy of resolution enhancement
Period *Obligations*
 08/01/87-07/31/90 FY89: \$15,379 TOTAL: \$33,580
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Rayborn, G. H. LARC/Wood, G. M. 19-Phys Sci, NEC
 LARC/Lewis, B. W.

NASW 4320 **University of Southern Mississippi** **4169**
 Enhancements being made to the existing sort aid software package
Period *Obligations*
 04/22/88-04/21/89 FY89: \$16,000 TOTAL: \$56,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Huffman, D. HQ-CU/Bivins, R. G. 22-Computer Science

NAS13-326 **University of Southern Mississippi** **4170**
 Operation of an automated manufacturing applications center
Period *Obligations*
 10/14/87-10/13/90 FY89: TOTAL: \$199,944
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Huffman, G. D. SSC/Barlow, R. M. 22-Computer Science

MISSOURI

NAG 2-454 **Saint Louis University** **4171**
 Skeletal collagen turnover by the osteoblast
Period *Obligations*
 03/01/87-12/31/89 FY89: \$55,000 TOTAL: \$145,100
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Partridge, N. C. ARC/Holton, E. M. 51-Biological Sci

NASA'S UNIVERSITY PROGRAM
MISSOURI (Continued)

NAG 1-875 University of Missouri - Columbia 4172
 Engineering specifications and system design for computer aided design computer aided manufacture of custom shoes

Period	Obligations	
05/15/88-03/31/90	FY89: \$68,000	TOTAL: \$94,999
Prin. Invest.	NASA Tech. Officer	CASE Category
Bao, H. P.	LARC/Farmer, F. H.	49-Engr, NEC
	LARC/Samos, J.	

NAG 2-589 University of Missouri - Columbia 4173
 Portable life support system/heat rejection

Period	Obligations	
08/01/89-12/31/90	FY89: \$110,739	TOTAL: \$110,739
Prin. Invest.	NASA Tech. Officer	CASE Category
Miles, J. B.	ARC/Webbbon, B. W.	41-Aero Engr
	ARC/Lomax, W. C.	

NCC 2-199 University of Missouri - Columbia 4174
 Aerodynamic holography in transonic flow

Period	Obligations	
07/01/82-06/30/89	FY89:	TOTAL: \$67,350
Prin. Invest.	NASA Tech. Officer	CASE Category
Miles, J. B.	ARC/Brown, J. L.	41-Aero Engr

NCC 2-566 University of Missouri - Columbia 4175
 Transonic three dimensional flow experimentation

Period	Obligations	
01/01/89-12/31/89	FY89: \$39,190	TOTAL: \$39,190
Prin. Invest.	NASA Tech. Officer	CASE Category
Miles, J. B.	ARC/Brown, J. L.	41-Aero Engr

NGT 00-050-061 University of Missouri - Columbia 4176
 NASA graduate student researchers program

Period	Obligations	
07/01/86-06/30/89	FY89:	TOTAL: \$54,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Marrero, T. R.	HQ-XE/Owens, F. C.	43-Chem Engr

NAG 1-380 University of Missouri - Rolla 4177
 Transport properties of air at high temperatures

Period	Obligations	
07/01/83-12/31/89	FY89:	TOTAL: \$88,975
Prin. Invest.	NASA Tech. Officer	CASE Category
Biolsi Jr., L.	LARC/Sutton, K.	12-Chemistry
	LARC/Jones, J. J.	

NAG 1-814 University of Missouri - Rolla 4178
 The application of computational methods to long range atmospheric acoustic propagation

Period	Obligations	
01/01/88-12/31/89	FY89:	TOTAL: \$140,966
Prin. Invest.	NASA Tech. Officer	CASE Category
Eversman, W.	LARC/Watson, W. R.	13-Physics

NAG 1-861 University of Missouri - Rolla 4179
 Characterization of extinction and reignition of hydrogen-air diffusion flame

Period	Obligations	
03/01/88-04/14/90	FY89: \$41,532	TOTAL: \$61,532
Prin. Invest.	NASA Tech. Officer	CASE Category
Isaac, K. M.	LARC/Pellet, G. L.	43-Chem Engr
	LARC/Northam, G. B.	

NAG 1-975 University of Missouri - Rolla 4180
 An aerodynamic tradeoff study of the scissor wing configuration

Period	Obligations	
03/01/89-02/28/90	FY89: \$30,000	TOTAL: \$30,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Selberg, B. P.	LARC/Henderson, W. P.	41-Aero Engr

NAG 3-178 University of Missouri - Rolla 4181
 Study of sound transmission in high speed flows

Period	Obligations	
08/31/81-12/31/89	FY89: \$40,082	TOTAL: \$290,652
Prin. Invest.	NASA Tech. Officer	CASE Category
Eversman, W.	LERC/Dittmar, J. H.	41-Aero Engr
Wicks, T.	LERC/Baumeister, K. J.	

NAG 8-779 University of Missouri - Rolla 4182
 Use of microgravity to improve the efficiency and power output of nd doped laser glasses

Period	Obligations	
07/01/89-06/30/90	FY89: \$64,446	TOTAL: \$64,446
Prin. Invest.	NASA Tech. Officer	CASE Category
Ray, C. S.	MSFC/Ethridge, E. C.	12-Chemistry

NAS 8-34758 University of Missouri - Rolla 4183
 Containerless processing of glass forming melts in space

Period	Obligations	
03/02/82-12/31/89	FY89: \$100,000	TOTAL: \$763,614
Prin. Invest.	NASA Tech. Officer	CASE Category
Day, D. E.	MSFC/Fogle, V.	13-Physics
	MSFC/Williams, J. R.	

NAG 5-1157 University of Missouri - Saint Louis 4184
 The formation and evolution of dust embedded clusters

Period	Obligations	
07/01/89-06/30/90	FY89: \$23,883	TOTAL: \$23,883
Prin. Invest.	NASA Tech. Officer	CASE Category
Wilking, B. A.	GSFC/Kondo, Y.	11-Astronomy

NAGW 1116 University of Missouri - Saint Louis 4185
 Distribution and evolution of Martian volatiles

Period	Obligations	
06/01/87-11/30/89	FY89: \$14,892	TOTAL: \$73,403
Prin. Invest.	NASA Tech. Officer	CASE Category
James, P. B.	HQ-EL/Bergstrahl, J. T.	31-Atmos Sci
	HQ-EL/Quaide, W. L.	

NAG 1-639 Washington University 4186
 Solution of geometrically nonlinear statics problems by the p-version of the finite element method

Period	Obligations	
03/01/86-12/31/89	FY89: \$71,348	TOTAL: \$253,655
Prin. Invest.	NASA Tech. Officer	CASE Category
Szabo, B. A.	LARC/Knight, N. F.	41-Aero Engr
	LARC/Stroud, W. J.	

NAG 3-578 Washington University 4187
 Investigation of cryogenic propellant management in a low-gravity environment

Period	Obligations	
11/01/84-02/12/90	FY89: \$80,000	TOTAL: \$354,500
Prin. Invest.	NASA Tech. Officer	CASE Category
Hochstein, J. I.	LERC/Chato, D. J.	46-Mech Engr
	LERC/Aydelott, J. C.	

NASA'S UNIVERSITY PROGRAM

MISSOURI (Continued)

NAG 3-817	Washington University	4188	Dynamic modeling of solar dynamic power components and systems
<i>Period</i>	<i>Obligations</i>		
08/26/87-08/24/90	FY89: \$35,000	TOTAL: \$223,204	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hochstein, J. I.	LERC/Miller, D. R.	46-Mech Engr	
Korakianitis, T. P.	LERC/Wulf, R. F.		
NAG 3-905	Washington University	4189	Modeling of cryogenic propellant behavior in propellant management systems
<i>Period</i>	<i>Obligations</i>		
05/15/88-09/15/88	FY89:	TOTAL: \$20,700	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hochstein, J. I.	LERC/Hardy, T. L.	46-Mech Engr	
	LERC/Dewitt, R.		
NAG 5-846	Washington University	4190	Scintillating optical fiber trajectory detector studies for astromog
<i>Period</i>	<i>Obligations</i>		
09/15/86-07/31/89	FY89: \$45,890	TOTAL: \$156,355	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Binns, W. R.	GSFC/Ormes, J. F.	11-Astronomy	
Israel, M. H.			
Klarmann, J.			
NAG 8-498	Washington University	4191	Analysis of data from the HEAO heavy nuclei experiment (C3)
<i>Period</i>	<i>Obligations</i>		
10/01/84-09/30/89	FY89: \$110,000	TOTAL: \$658,500	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Israel, M. H.	MSFC/Havrisik, D. M.	11-Astronomy	
NAG 9-7	Washington University	4192	Lunar and planetary surface dynamics and early history
<i>Period</i>	<i>Obligations</i>		
02/01/80-02/01/90	FY89: \$182,284	TOTAL: \$1,393,684	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hohenberg, C. M.	JSC/Browne, I. D.	31-Atmos Sci	
NAG 9-55	Washington University	4193	Solid state and mass spectrometric measurements of extraterrestrial
<i>Period</i>	<i>Obligations</i>		
02/01/83-12/01/89	FY89: \$710,569	TOTAL: \$3,220,100	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Walker, R. M.	JSC/Browne, I. D.	32-Geological Sci	
	ARC/Corsiglia, V. R.		
NAG 9-56	Washington University	4194	Analytical, experimental, and modeling studies of lunar and terrestrial igneous rocks
<i>Period</i>	<i>Obligations</i>		
02/01/83-12/01/89	FY89: \$187,500	TOTAL: \$1,385,827	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Haskin, L. A.	JSC/Browne, I. D.	32-Geological Sci	
Korotev, R. L.			
Lindstrom, D. J.			
NAG 9-98	Washington University	4195	Geochemistry and petrology of isotopically dated Archean ultramafic and mafic rocks from west Greenland
<i>Period</i>	<i>Obligations</i>		
03/01/85-09/01/88	FY89:	TOTAL: \$63,700	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Dymek, R. F.	JSC/Phinney, W. C.	32-Geological Sci	
NAG 9-223	Washington University	4196	U PB geochronology and ND isotopic studies of the slave province nwl Canada
<i>Period</i>	<i>Obligations</i>		
05/01/87-05/01/90	FY89: \$25,000	TOTAL: \$64,500	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Bowring, S. A.	JSC/Browne, I. D.	32-Geological Sci	
NAG 9-292	Washington University	4197	RB SR and SM ND geochronology and isotopic systematics of diamonds
<i>Period</i>	<i>Obligations</i>		
04/01/88-04/01/90	FY89: \$57,319	TOTAL: \$67,319	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Podosek, F.	JSC/Browne, I. D.	32-Geological Sci	
NAGW 122	Washington University	4198	Proposal for the innovative research program
<i>Period</i>	<i>Obligations</i>		
11/15/80-05/14/90	FY89: \$70,000	TOTAL: \$1,180,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Walker, R. M.	HQ-E/Alexander, J. K.	99-Multi-Discip	
Israel, M. H.	HQ-E/Holland, D. A.		
NAGW 432	Washington University	4199	Structure and evolution of outer planet satellite
<i>Period</i>	<i>Obligations</i>		
03/01/83-12/31/89	FY89: \$33,575	TOTAL: \$228,961	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
McKinnon, W. B.	HQ-EL/Underwood, J.	32-Geological Sci	
	HQ-EL/Boyce, J. M.		
NAGW 592	Washington University	4200	Annihilation radiation in cosmic gamma ray bursts
<i>Period</i>	<i>Obligations</i>		
04/01/84-10/31/89	FY89: \$15,000	TOTAL: \$103,710	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Katz, J.	HQ-EZ/Kaluzienski, L. J.	39-Env Sci, NEC	
	HQ-EZ/Bunner, A. N.		
NAGW 883	Washington University	4201	High resolution spectral imagery of Halley's comet and of p-gracobi-zinnes
<i>Period</i>	<i>Obligations</i>		
04/01/86-08/30/88	FY89:	TOTAL: \$102,069	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Smith, W. H.	HQ-EL/Brinton, H. C.	11-Astronomy	
	HQ-EL/Rahe, J. H.		
NAGW 1215	Washington University	4202	Physical studies of Uranian satellite geologic materials
<i>Period</i>	<i>Obligations</i>		
09/15/87-12/31/88	FY89:	TOTAL: \$14,264	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
McKinnon, W. B.	HQ-EL/Quaide, W. L.	19-Phys Sci, NEC	
	HQ-EL/Underwood, J.		
NAGW 1358	Washington University	4203	Toward global perspectives on continental tectonics using remote sensing field and laboratory data
<i>Period</i>	<i>Obligations</i>		
05/01/88-12/31/89	FY89: \$189,588	TOTAL: \$327,749	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Arvidson, R. E.	HQ-EE/Baltuck, M.	32-Geological Sci	
	HQ-EE/Ruzek, M. R.		

NASA'S UNIVERSITY PROGRAM
MISSOURI (Continued)

NAGW 1603 Washington University 4204
 Definition and development of recoverable instrumentation for dust particle trajectory determination and isotopic and elemental analysis
Period Obligations
 01/01/89-10/31/89 FY89: \$126,998 TOTAL: \$126,998
Prin. Invest. NASA Tech. Officer CASE Category
 Walker, R. M. HQ-EL/Mahaffy, P. 32-Geological Sci

NAGW 1728 Washington University 4205
 Transduction of the gravitropic stimulus
Period Obligations
 06/01/89-05/31/90 FY89: \$84,022 TOTAL: \$84,022
Prin. Invest. NASA Tech. Officer CASE Category
 Pickard, B. G. HQ-E/Alexander, J. K. 51-Biological Sci
 HQ-E/Holland, D. A.

NAGW 1801 Washington University 4206
 An interferometric spectral mapper for the Cassini mission design and development program
Period Obligations
 04/01/89-10/31/89 FY89: \$105,072 TOTAL: \$105,072
Prin. Invest. NASA Tech. Officer CASE Category
 Smith, W. H. HQ-EL/Mahaffy, P. R. 11-Astronomy

NAG10-22 Washington University 4207
 Study entitled role of auxin in normal and aberrant gravitropism of tomato seedlings
Period Obligations
 06/18/85-12/31/89 FY89: \$35,000 TOTAL: \$130,000
Prin. Invest. NASA Tech. Officer CASE Category
 Pickard, B. KSC/Knott, W. N. 39-Env Sci, NEC

NAG10-34 Washington University 4208
 Technology to develop a digital hearing aid
Period Obligations
 10/01/86-10/01/87 FY89: TOTAL: \$49,924
Prin. Invest. NASA Tech. Officer CASE Category
 Morley, R. E. KSC/Davis, R. M. 99-Multi-Discip

NASW 4017 Washington University 4209
 Mapping surface materials via remote sensing data in Missouri and Egypt
Period Obligations
 03/18/85-09/17/88 FY89: \$10 TOTAL: \$418,124
Prin. Invest. NASA Tech. Officer CASE Category
 Arvidson, R. E. HQ-EE/Evans, D. 19-Phys Sci, NEC
 Guinness, E.
 Sultan, M.

NCA 2-151 Washington University 4210
 Band strengths of selected CH4 bands at low temperatures
Period Obligations
 08/01/86-12/01/87 FY89: TOTAL: \$24,683
Prin. Invest. NASA Tech. Officer CASE Category
 Smith, W. H. ARC/Pollack, J. B. 12-Chemistry
 Conner, C.

NCA 2-222 Washington University 4211
 Canal otolith interaction in the vestibulo ocular reflex
Period Obligations
 06/01/87-07/31/89 FY89: TOTAL: \$76,140
Prin. Invest. NASA Tech. Officer CASE Category
 Paige, G. ARC/Tomko, D. 56-Medical Sciences

NCC 2-627 Washington University 4212
 Adaptation to microgravity of oculomotor reflexes
Period Obligations
 05/01/89-04/30/90 FY89: \$96,201 TOTAL: \$96,201
Prin. Invest. NASA Tech. Officer CASE Category
 Paige, G. D. ARC/Tomko, D. L. 51-Biological Sci
 ARC/Kirk, P. J.

NGR 26-008-001 Washington University 4213
 Determination of characteristics of high altitude primary cosmic radiation at low latitudes
Period Obligations
 09/01/61-10/31/89 FY89: \$295,000 TOTAL: \$3,925,517
Prin. Invest. NASA Tech. Officer CASE Category
 Israel, M. H. HQ-ES/Mellott, M. M. 11-Astronomy
 Klarmann, J. HQ-ES/Jones, W. V.
 Binns, W. R.

NGT 00-050-007 Washington University 4214
 NASA graduate student researchers program
Period Obligations
 05/01/86-10/31/89 FY89: TOTAL: \$72,000
Prin. Invest. NASA Tech. Officer CASE Category
 Simmons, D. J. HQ-LE/Owens, F. C. 71-Anthropology

NGT 00-050-024 Washington University 4215
 NASA graduate student researchers program
Period Obligations
 06/01/86-05/31/88 FY89: TOTAL: \$33,459
Prin. Invest. NASA Tech. Officer CASE Category
 Walker, R. M. HQ-EE/Richman, J. G. 13-Physics

NGT 00-050-138 Washington University 4216
 NASA graduate student researchers program
Period Obligations
 06/01/87-08/31/89 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
 Szabo, B. A. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 00-050-162 Washington University 4217
 NASA graduate student researchers program
Period Obligations
 10/01/87-09/30/89 FY89: \$18,000 TOTAL: \$34,500
Prin. Invest. NASA Tech. Officer CASE Category
 Arvidson, R. E. HQ-XE/Owens, F. C. 99-Multi-Discip

NGT 00-050-181 Washington University 4218
 NASA graduate student researchers program
Period Obligations
 06/01/87-05/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
 Podeseck, F. HQ-XE/Owens, F. C. 32-Geological Sci

NGT 00-050-182 Washington University 4219
 NASA graduate student researchers program
Period Obligations
 06/01/87-05/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
 Klarmann, J. HQ-XE/Owens, F. C. 13-Physics

NASA'S UNIVERSITY PROGRAM **MISSOURI (Continued)**

NGT 00-050-194 Washington University 4220
NASA graduate student researchers program
Period Obligations
06/01/87-05/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Hohenberg, C. M. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-289 Washington University 4221
NASA graduate student researchers program
Period Obligations
10/01/88-09/30/90 FY89: TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Arvidson, R. E. HQ-XE/Owens, F. C. 32-Geological Sci

NGT 00-050-295 Washington University 4222
NASA graduate student researchers program
Period Obligations
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Croaz, G. HQ-XE/Owens, F. C. 12-Chemistry

NGT 26-010-800 Washington University 4223
NASA graduate student researchers program
Period Obligations
09/15/84-10/14/88 FY89: \$2,700 TOTAL: \$48,525
Prin. Invest. NASA Tech. Officer CASE Category
Miller, J. G. HQ-LB/Owens, F. C. 13-Physics

NSG 1601 Washington University 4224
Quantitative non-destructive evaluation of composite materials based on ultrasonic wave propagation
Period Obligations
03/15/79-03/14/90 FY89: \$109,618 TOTAL: \$996,819
Prin. Invest. NASA Tech. Officer CASE Category
Miller, J. G. LARC/Madaras, E. T. 13-Physics
LARC/Heyman, J. S.

NSG 7087 Washington University 4225
Computerized analysis of Martian crater and Aeolian feature data
Period Obligations
08/01/74-09/30/89 FY89: \$122,560 TOTAL: \$1,465,933
Prin. Invest. NASA Tech. Officer CASE Category
Arvidson, R. E. HQ-EL/Scott, D. H. 32-Geological Sci
HQ-EL/Underwood, J. R.

NSG 7334 Washington University 4226
Continued research interferometric method
Period Obligations
04/01/77-08/30/88 FY89: TOTAL: \$875,539
Prin. Invest. NASA Tech. Officer CASE Category
Smith, W. H. HQ-EL/Brinton, H. C. 11-Astronomy
HQ-EL/Rahe, J. H.

MONTANA

NAG 5-1229 Montana State University 4227
Temporal and spectral studies of some active galactic nuclei
Period Obligations
09/01/89-08/31/90 FY89: \$20,000 TOTAL: \$20,000
Prin. Invest. NASA Tech. Officer CASE Category
Tsuruta, S. GSFC/West, D. 11-Astronomy

NAG 8-736 Montana State University 4228
Temporal and spectral studies of some active galactic nuclei
Period Obligations
08/01/88-07/31/89 FY89: TOTAL: \$23,955
Prin. Invest. NASA Tech. Officer CASE Category
Tsuruta, S. MSFC/Harper, B. A. 11-Astronomy

NAG 8-783 Montana State University 4229
Temporal and spectral studies of Seyfert nuclei
Period Obligations
06/01/89-05/31/90 FY89: \$36,887 TOTAL: \$36,887
Prin. Invest. NASA Tech. Officer CASE Category
Tsuruta, S. MSFC/Vargas, J. 31-Atmos Sci
Halpern, J.
Ward, M.

NAG 9-241 Montana State University 4230
Aqueous iodine bioridal efficacy
Period Obligations
06/01/87-06/01/90 FY89: \$68,500 TOTAL: \$193,501
Prin. Invest. NASA Tech. Officer CASE Category
McFeters, G. A. JSC/Sauer, R. L. 12-Chemistry
Pyle, B. H.

NAG 9-316 Montana State University 4231
Electrochemical methods applicable to water quality under microgravity conditions
Period Obligations
09/15/88-09/14/89 FY89: TOTAL: \$14,782
Prin. Invest. NASA Tech. Officer CASE Category
Geer, R. D. JSC/Goldstein, S. H. 19-Phys Sci. NEC

NGT 00-050-217 Montana State University 4232
NASA graduate student researchers program
Period Obligations
07/01/87-06/30/90 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
McFeters, G. A. HQ-XE/Owens, F. C. 51-Biological Sci

NAGW 952 University of Montana 4233
Extrapolation of process models of evapotranspiration and net primary production of coniferous forests to large spatial scales
Period Obligations
10/01/86-03/31/90 FY89: \$146,430 TOTAL: \$363,409
Prin. Invest. NASA Tech. Officer CASE Category
Running, S. W. HQ-EE/Wickland, D. E. 39-Env Sci, NEC
Potts, D. F. HQ-EE/Ruzek, M. J.
Band, L. E.

NCA 2-252 University of Montana 4234
Dynamic simulation of the water and nitrogen interactions controlling canopy processes using remotely sensed inputs
Period Obligations
09/01/87-06/30/89 FY89: TOTAL: \$39,462
Prin. Invest. NASA Tech. Officer CASE Category
Running, S. W. ARC/Peterson, D. L. 54-Env Biology

NASA'S UNIVERSITY PROGRAM NEBRASKA

NEBRASKA

NAG 3-95 University of Nebraska - Lincoln 4235
 Intercalated carbon fiber conductor for aerospace use
Period Obligations
 09/01/80-01/24/90 FY89: \$45,000 TOTAL: \$363,482
Prin. Invest. NASA Tech. Officer CASE Category
 Woollam, J. A. LERC/Jaworske, D. A. 45-Elec Engr

NAG 3-154 University of Nebraska - Lincoln 4236
 Surface passivation of III IV compound semiconductors for microwave applications
Period Obligations
 03/10/81-12/31/89 FY89: \$25,000 TOTAL: \$592,652
Prin. Invest. NASA Tech. Officer CASE Category
 Woollam, J. A. LERC/Pouch, J. J. 13-Physics

NAG 3-806 University of Nebraska - Lincoln 4237
 Error protection for digital image transmission over noisy channels
Period Obligations
 07/01/87-08/15/90 FY89: \$60,198 TOTAL: \$146,252
Prin. Invest. NASA Tech. Officer CASE Category
 Sayood, K. LERC/Whyte, W. A. 45-Elec Engr
 LERC/Miller, E. F.

NAG 3-866 University of Nebraska - Lincoln 4238
 Laser deposition of thin film superconductors for microelectronics preparation and evaluation
Period Obligations
 01/15/88-01/13/90 FY89: \$50,000 TOTAL: \$100,000
Prin. Invest. NASA Tech. Officer CASE Category
 Woolam, J. A. LERC/Warner, J. D. 13-Physics
 Ianno, N. J.

NAG 5-825 University of Nebraska - Lincoln 4239
 Far ultraviolet study of supergiant semideloched and contact systems
Period Obligations
 08/01/86-07/31/88 FY89: TOTAL: \$24,000
Prin. Invest. NASA Tech. Officer CASE Category
 Leung, K. C. GSFC/Kondo, Y. 11-Astronomy

NAG 5-839 University of Nebraska - Lincoln 4240
 The evolution and chromospheric phenomems in dwarf Cepheids
Period Obligations
 09/01/86-06/30/88 FY89: TOTAL: \$13,700
Prin. Invest. NASA Tech. Officer CASE Category
 Schmidt, E. G. GSFC/Kondo, Y. 11-Astronomy

NAG 5-890 University of Nebraska - Lincoln 4241
 Measurement and analysis of latent and sensible heat flux
Period Obligations
 04/15/87-01/31/90 FY89: \$150,000 TOTAL: \$327,004
Prin. Invest. NASA Tech. Officer CASE Category
 Verma, S. B. GSFC/Toll, D. 39-Env Sci, NEC
 GSFC/Hall, F.

NAG 5-894 University of Nebraska - Lincoln 4242
 Measuring and modeling near surface reflected and emitted radiation fluxes
Period Obligations
 04/15/87-01/31/90 FY89: \$185,000 TOTAL: \$400,099
Prin. Invest. NASA Tech. Officer CASE Category
 Blad, B. L. GSFC/Toll, D. L. 39-Env Sci, NEC
 GSFC/Hall, F.

NAG 5-916 University of Nebraska - Lincoln 4243
 Design of source coders and joint source channel coders for noisy channels
Period Obligations
 06/01/87-06/14/90 FY89: \$34,950 TOTAL: \$123,930
Prin. Invest. NASA Tech. Officer CASE Category
 Sayood, K. GSFC/Yeh, P. S. 49-Engr, NEC
 GSFC/Morakis, J. C.

NAG 5-957 University of Nebraska - Lincoln 4244
 Modeling vegetation atmosphere interactions for Fife
Period Obligations
 07/15/87-12/14/89 FY89: TOTAL: \$5,342
Prin. Invest. NASA Tech. Officer CASE Category
 Norman, J. GSFC/Camillo, P. 39-Env Sci, NEC
 GSFC/Gurney, R. J.

NAGW 983 University of Nebraska - Lincoln 4245
 FOS simultaneity in optical and thermal on Konza prairie
Period Obligations
 12/01/86-07/31/89 FY89: TOTAL: \$19,973
Prin. Invest. NASA Tech. Officer CASE Category
 Norman, J. M. HQ-EE/Tuyahov, A. J. 39-Env Sci, NEC

NAGW 1099 University of Nebraska - Lincoln 4246
 Directional radiance modeling of vegetation in thermal and solar wavebands
Period Obligations
 06/01/87-11/30/88 FY89: TOTAL: \$74,000
Prin. Invest. NASA Tech. Officer CASE Category
 Norman, J. M. HQ-EE/Ruzek, M. J. 39-Env Sci, NEC
 Walter, E. A. HQ-EE/Murphy, R. E.

NAGW 1266 University of Nebraska - Lincoln 4247
 Synoptic analysis of ice melt from Nimbus-7 SMMR
Period Obligations
 09/01/87-12/31/89 FY89: \$48,685 TOTAL: \$92,112
Prin. Invest. NASA Tech. Officer CASE Category
 Anderson, M. R. HQ-EE/Thomas, R. H. 33-Oceanography
 HQ-EE/Wilson, W. S.

NAGW 1275 University of Nebraska - Lincoln 4248
 Surface recordings of vistibular responses to pulsed acceleration
Period Obligations
 12/01/87-11/30/89 FY89: \$20,000 TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
 Jones, T. A. HQ-EB/Halstead, T. W. 51-Biological Sci

NAGW 1751 University of Nebraska - Lincoln 4249
 Interaction of radiation with planetary gases
Period Obligations
 06/01/89-11/30/89 FY89: \$19,865 TOTAL: \$19,865
Prin. Invest. NASA Tech. Officer CASE Category
 Samson, J. A. HQ-EL/Bergstrahl, J. T. 11-Astronomy

NCA 2-318 University of Nebraska - Lincoln 4250
 Development of composite finite dynamic elements for analysis of aircraft structures
Period Obligations
 06/01/88-05/31/90 FY89: \$35,940 TOTAL: \$69,900
Prin. Invest. NASA Tech. Officer CASE Category
 Martin, C. W. ARC/Gupta, K. K. 41-Aero Engr

NASA'S UNIVERSITY PROGRAM **NEBRASKA (Continued)**

NGR 28-004-021 University of Nebraska - Lincoln 4251
Interaction of radiation with planetary gases
Period *Obligations*
02/23/73-05/31/89 FY89: \$15,973 TOTAL: \$626,112
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Samson, J. A. HQ-EL/Fox, K. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NEVADA

NCC 2-577 Univ. of Nevada - Desert Res. Inst. 4252
Exobiology site selection for future Mars missions Martian paleolake sediments and terrestrial analogs
Period *Obligations*
11/15/88-11/14/89 FY89: \$90,310 TOTAL: \$90,310
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wharton, R. A. ARC/Carle, G. C. 59-Life Sci, NEC

NAGW 1585 University of Nevada - Las Vegas 4253
Studies of cometary ions
Period *Obligations*
12/01/88-11/30/89 FY89: \$85,000 TOTAL: \$85,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Farley, J. W. HQ-EL/Bergstralh, J. T. 11-Astronomy

NAGW 913 University of Nevada - Reno 4254
Geobotanical remote sensing of alluvial geomorphology and environmental stress in the Owens Valley California
Period *Obligations*
07/01/86-04/15/89 FY89: \$1,150 TOTAL: \$105,024
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Mouat, D. A. HQ-EE/Baltuck, M. 32-Geological Sci
HQ-EE/Murphy, R. E.

NAGW 923 University of Nevada - Reno 4255
Utilization and development of orbital platform hosted remote sensing technology
Period *Obligations*
08/01/86-04/30/90 FY89: \$150,079 TOTAL: \$399,115
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Taranik, J. V. HQ-EE/Tuyahov, A. J. 32-Geological Sci
Borengasser, M. X. HQ-EE/Estes, J. E.
Balogh, M. E.

NAGW 1679 University of Nevada - Reno 4256
Application of thermal infrared multispectral scanner TIMS data to a study of plutonic assemblages in the Sierra Nevada Batholith CA
Period *Obligations*
02/01/89-01/31/90 FY89: \$34,846 TOTAL: \$34,846
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Taranik, J. V. HQ-EE/Baltuck, M. 32-Geological Sci
HQ-EE/Ruzek, M. R.

NAS 5-28765 University of Nevada - Reno 4257
The nature and origin of mineral coatings on volcanic rocks of the Black Mountain, Stonewall Mountain and Kane Springs Wash volcanic centers in southern Nevada
Period *Obligations*
07/30/85-08/15/89 FY89: TOTAL: \$308,276
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Taranik, J. V. GSFC/Oseroff, H. 32-Geological Sci

NCA 2-182 University of Nevada - Reno 4258
Exobiology site selection for future Mars missions Martian paleolake sediments and terrestrial analogs
Period *Obligations*
11/15/86-11/14/88 FY89: TOTAL: \$80,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wharton, R. A. ARC/McKay, C. P. 31-Atmos Sci

NCC 2-507 University of Nevada - Reno 4259
Numerical investigations in three dimensional internal flows
Period *Obligations*
10/01/87-12/31/89 FY89: \$40,957 TOTAL: \$80,619
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Rose, W. C. ARC/Bencze, D. P. 41-Aero Engr

NGT 00-050-157 University of Nevada - Reno 4260
NASA graduate student researchers program
Period *Obligations*
06/01/87-05/31/89 FY89: TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Taranik, J. V. HQ-XE/Owens, F. C. 32-Geological Sci

NEW HAMPSHIRE

NAG 2-480 Dartmouth College 4261
A network system administration system
Period *Obligations*
09/01/87-09/30/89 FY89: TOTAL: \$35,807
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bishop, M. A. ARC/Fernquist, A. R. 22-Computer Science
ARC/Wall, W. D.

NAG 3-775 Dartmouth College 4262
Improving the low temperature ductility of the by intermetallic nual
Period *Obligations*
04/01/87-06/30/90 FY89: \$49,986 TOTAL: \$149,433
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Baker, I. LERC/Nathal, M. V. 47-Materials Engr

NAG 5-971 Dartmouth College 4263
Ultraviolet spectra of sublumious object systematic reanalysis of the archived ultraviolet spectra of white dwarfs
Period *Obligations*
09/01/87-08/31/89 FY89: TOTAL: \$62,600
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wegner, G. A. GSFC/Kondo, Y. 11-Astronomy

NAG 5-1077 Dartmouth College 4264
High resolution doppler imaging of aurora on Jupiter and Saturn
Period *Obligations*
10/01/88-09/30/89 FY89: TOTAL: \$4,980
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hudson, M. K. GSFC/Kondo, Y. 11-Astronomy

NAG 5-1098 Dartmouth College 4265
A theoretical study of the global geospace system
Period *Obligations*
11/01/88-10/31/89 FY89: \$113,972 TOTAL: \$113,972
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hudson, M. K. GSFC/Curtis, S. A. 13-Physics
GSFC/Acuna, M. H.

**NASA'S UNIVERSITY PROGRAM
NEW HAMPSHIRE (Continued)**

NAG 5-1250 Dartmouth College 4266
Systematic reanalysis of the archived ultraviolet spectra of white dwarfs
Period Obligations
09/15/89-12/14/89 FY89: \$7,500 TOTAL: \$7,500
Prin. Invest. NASA Tech. Officer CASE Category
Wegner, G. A. GSFC/West, D. 11-Astronomy

NAS 5-29233 Dartmouth College 4274
ISTP theory investigation
Period Obligations
10/01/85-06/30/88 FY89: TOTAL: \$12,778
Prin. Invest. NASA Tech. Officer CASE Category
Hudson, M. K. GSFC/O'Brien, J. 13-Physics

NAG 5-1277 Dartmouth College 4267
Survey of infrared emission around Wolf-Rayet stars
Period Obligations
10/01/89-08/31/90 FY89: \$9,200 TOTAL: \$9,200
Prin. Invest. NASA Tech. Officer CASE Category
Fesen, R. A. GSFC/West, D. 11-Astronomy

NASW 4049 Dartmouth College 4275
Lithologic mapping in forested areas
Period Obligations
03/01/85-01/31/88 FY89: TOTAL: \$79,055
Prin. Invest. NASA Tech. Officer CASE Category
Birnie, R. W. HQ-EE/Mark, P. M. 32-Geological Sci
HQ-EE/Murphy, R. E.

NAGW 710 Dartmouth College 4268
On turbulence in plasmas
Period Obligations
01/01/85-12/31/89 FY89: \$85,894 TOTAL: \$435,901
Prin. Invest. NASA Tech. Officer CASE Category
Montgomery, D. C. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Jones, W. V.

NGT 00-050-376 Dartmouth College 4276
NASA graduate student researchers program
Period Obligations
09/15/88-09/14/90 FY89: TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Kennedy, F. HQ-XE/Owens, F. C. 46-Mech Engr

NAGW 809 Dartmouth College 4269
The relationship between kinetic equilibrium and dynamic MHD models of magnetospheric ionosphere coupling
Period Obligations
09/01/85-02/28/89 FY89: TOTAL: \$213,090
Prin. Invest. NASA Tech. Officer CASE Category
Hudson, M. K. HQ-ES/Desch, M. D. 13-Physics
HQ-ES/Parks, G.

NGT 00-050-466 Dartmouth College 4277
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Sonnerup, B. O. HQ-XE/Owens, F. C. 49-Engr, NEC

NAGW 1082 Dartmouth College 4270
Testing crustal heating and climatic change as alternative hypothesis for small valley origins
Period Obligations
05/01/87-04/30/90 FY89: \$11,999 TOTAL: \$39,257
Prin. Invest. NASA Tech. Officer CASE Category
Brakenridge, G. R. HQ-EL/Underwood, J. R. 32-Geological Sci
HQ-EL/Boyce, J. M.

NAG 1-890 University of New Hampshire - Durham 4278
Methane fluxes from Northern peatlands
Period Obligations
07/01/88-02/28/90 FY89: \$13,350 TOTAL: \$123,350
Prin. Invest. NASA Tech. Officer CASE Category
Crill, P. M. LARC/Lawrence, J. D. 31-Atmos Sci
Moore, B. E.

NAGW 1169 Dartmouth College 4271
Turbulent processes in magnetospheric boundary layers
Period Obligations
09/01/87-02/28/90 FY89: TOTAL: \$117,000
Prin. Invest. NASA Tech. Officer CASE Category
Lotko, W. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Perry, T. W.

NAG 1-936 University of New Hampshire - Durham 4279
Organic acid and selected nitrogen species for arctic boundary layer experiment
Period Obligations
12/01/88-11/30/89 FY89: \$166,468 TOTAL: \$166,468
Prin. Invest. NASA Tech. Officer CASE Category
Talbot, R. W. LARC/Bartlett, D. S. 31-Atmos Sci

NAGW 1652 Dartmouth College 4272
Time dependent nature of auroral phenomena
Period Obligations
03/01/89-02/28/90 FY89: \$70,000 TOTAL: \$70,000
Prin. Invest. NASA Tech. Officer CASE Category
Hudson, M. K. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Perry, T. W.

NAG 1-938 University of New Hampshire - Durham 4280
Methane FWX from the Yukon Kuskokwim delta
Period Obligations
01/01/89-12/31/89 FY89: \$70,982 TOTAL: \$70,982
Prin. Invest. NASA Tech. Officer CASE Category
Crill, P. LARC/Lawrence, J. D. 31-Atmos Sci

NAS 5-28738 Dartmouth College 4273
The chemical evolution of mafic intrusions in east Greenland based on lithologic mapping using thematic mapper data
Period Obligations
05/24/85-04/24/89 FY89: TOTAL: \$199,784
Prin. Invest. NASA Tech. Officer CASE Category
Naslund, H. R. GSFC/Oseroff, H. 32-Geological Sci

NAG 1-1014 University of New Hampshire - Durham 4281
Mission science planning and implementation for global tropospheric experiment atmospheric boundary layer expedition GTE able
Period Obligations
05/15/89-05/14/90 FY89: \$34,585 TOTAL: \$34,585
Prin. Invest. NASA Tech. Officer CASE Category
Harriss, R. C. LARC/Hoell, J. M. 31-Atmos Sci

NASA'S UNIVERSITY PROGRAM **NEW HAMPSHIRE (Continued)**

NAG 2-521 University of New Hampshire - Durham 4282
 Construction and analysis of stereoscopic solar flare observations by pvo SMM satellites

Period	Obligations	
06/01/88-05/31/90	FY89: \$35,724	TOTAL: \$70,718
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Vestrand, W. T.	ARC/Lasher, L. E.	11-Astronomy
	ARC/Fimmel, R. O.	

NAG 5-515 University of New Hampshire - Durham 4283
 Pioneer cosmic ray experiment data analysis and interpretation

Period	Obligations	
03/15/85-12/31/89	FY89:	TOTAL: \$191,240
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Webber, W. R.	GSFC/McDonald, F. B.	11-Astronomy

NAG 5-656 University of New Hampshire - Durham 4284
 Rapidly varying space plasma phenomena

Period	Obligations	
06/01/89-05/31/90	FY89: \$105,000	TOTAL: \$105,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Torbert, R. B.	GSFC/Early, L. J.	13-Physics
	GSFC/Pless, R. H.	

NAG 5-720 University of New Hampshire - Durham 4285
 Research relative to the SMM gamma ray experiment

Period	Obligations	
11/15/85-11/14/89	FY89: \$591,541	TOTAL: \$2,440,839
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Chupp, E. L.	GSFC/Gordon, F.	19-Phys Sci, NEC

NAG 5-1190 University of New Hampshire - Durham 4286
 Breadboard and test an interface to parallel plate analyzer on hydra spectrometer on ISTEP-GGS

Period	Obligations	
07/15/89-07/14/90	FY89: \$45,000	TOTAL: \$45,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Torbert, R. B.	GSFC/Scudder, J. D.	13-Physics

NAG 6-12 University of New Hampshire - Durham 4287
 Investigation of auroral electrodynamics and argon (plasma) release for controlled studies

Period	Obligations	
04/23/81-04/22/90	FY89: \$288,471	TOTAL: \$1,284,642
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Arnoldy, R. L.	GSFC/Early, L. J.	19-Phys Sci, NEC
Kaufmann, R. L.	GSFC/Pless, R. H.	

NAGW 76 University of New Hampshire - Durham 4288
 Theoretical studies group on the physics of the solar atmosphere and the solar wind

Period	Obligations	
06/01/80-09/30/89	FY89: \$159,038	TOTAL: \$2,277,517
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Fisk, L. A.	HQ-EE/Butler, D. M.	13-Physics
Holweg, J. V.	HQ-EE/Curtis, S. A.	

NAGW 512 University of New Hampshire - Durham 4289
 Terminal decomposition and gaseous sulfur release from wetlands

Period	Obligations	
11/15/83-05/30/90	FY89: \$95,000	TOTAL: \$581,469
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hines, M. E.	HQ-EB/Averner, M. M.	31-Atmos Sci
Lyons, W. B.	HQ-EB/Devincenzi, D. L.	
Gaudette, H. E.		

NAGW 714 University of New Hampshire - Durham 4290
 Planetary biogeochemical cycles and their perturbation by humans

Period	Obligations	
01/01/85-12/31/89	FY89: \$325,182	TOTAL: \$1,169,480
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Moore, B.	HQ-EB/Averner, M. M.	51-Biological Sci
Meilillo, J. M.	HQ-EE/Wickland, D.	

NAGW 848 University of New Hampshire - Durham 4291
 Combining satellite and insitu data in an ocean basin model

Period	Obligations	
01/01/86-12/31/89	FY89: \$29,999	TOTAL: \$276,823
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Moore, B., III	HQ-EE/Lewis, M. R.	33-Oceanography
Copeland, A. H.	HQ-EE/Wilson, W. S.	

NAGW 980 University of New Hampshire - Durham 4292
 Global fronts of deforestation methodologies for retrospective and predictive modeling

Period	Obligations	
10/01/86-12/31/89	FY89: \$183,291	TOTAL: \$520,431
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Moore, B. E.	HQ-EE/Dodge, J. C.	39-Env Sci, NEC
Skole, D. L.	HQ-EE/Tuyahov, A. J.	

NAGW 1145 University of New Hampshire - Durham 4293
 Remote sensing of forest chemistry using aviris

Period	Obligations	
06/01/87-10/31/88	FY89:	TOTAL: \$59,343
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Aber, J. D.	HQ-EE/Wickland, D. E.	39-Env Sci, NEC
	HQ-EE/Ruzek, M.	

NAGW 1245 University of New Hampshire - Durham 4294
 Spectrocharacterization of forest decline damages

Period	Obligations	
10/01/87-09/30/89	FY89: \$190,500	TOTAL: \$401,270
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Rock, B. N.	HQ-EE/Wickland, D. E.	39-Env Sci, NEC
	HQ-EE/Ruzek, M. J.	

NAGW 1530 University of New Hampshire - Durham 4295
 A systematic interpretation of cosmic ray data

Period	Obligations	
11/01/88-10/31/89	FY89: \$28,300	TOTAL: \$28,300
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Webber, W. R.	HQ-ES/Mellott, M. M.	13-Physics
	HQ-ES/Jones, W. V.	

NAGW 1531 University of New Hampshire - Durham 4296
 Interstellar pickup ions in the distant solar wind

Period	Obligations	
11/01/88-10/31/89	FY89: \$39,897	TOTAL: \$39,897
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Isenberg, P. A.	HQ-ES/Mellott, M. M.	13-Physics
	HQ-ES/Jones, W. V.	

NAGW 1625 University of New Hampshire - Durham 4297
 Ion beam generation and interactions with the ionosphere

Period	Obligations	
03/01/89-02/28/90	FY89: \$40,000	TOTAL: \$40,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Kaufman, R. L.	HQ-ES/Mellott, M. M.	13-Physics
	HQ-ES/Perry, T. W.	

NASA'S UNIVERSITY PROGRAM NEW HAMPSHIRE (Continued)

NAGW 1726 University of New Hampshire - Durham 4298
Sources of atmospheric methane in the tropics impacts of human disturbance and climate change

Period	Obligations	
03/01/89-09/30/89	FY89: \$63,000	TOTAL: \$63,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Harriss, R.	HQ-EB/Averner, M. M.	54-Env Biology

NAGW 1826 University of New Hampshire - Durham 4299
Atmospheric methane sources in Northern environments

Period	Obligations	
07/01/89-12/31/89	FY89: \$76,000	TOTAL: \$76,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hariss, R. C.	HQ-EE/Kurylo, M. J.	31-Atmos Sci
	HQ-EE/Watson, R. T.	

NAS 5-26645 University of New Hampshire - Durham 4300
Definition phase of the D-1 detector subsystem for the imaging Compton telescope

Period	Obligations	
09/01/81-03/31/91	FY89: \$1,355,000	TOTAL: \$17,011,300
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Lockwood, J. A.	GSFC/Cooley, J.	11-Astronomy

NAS 5-30558 University of New Hampshire - Durham 4301
Earth observing system EOS interdisciplinary study

Period	Obligations	
08/16/89-12/14/90	FY89: \$45,000	TOTAL: \$45,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Moore, E.	GSFC/Soffen, G.	54-Env Biology

NAS 5-33002 University of New Hampshire - Durham 4302
Dpu for plasma instrument on ISTEP wind and polar instruments

Period	Obligations	
09/22/89-02/28/91	FY89: \$252,000	TOTAL: \$252,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Torbert, R.	GSFC/Ogilvie, K.	13-Physics

NCA 2-238 University of New Hampshire - Durham 4303
Changes in total biochemical content of forests subject to chronic acid deposition

Period	Obligations	
07/15/87-07/14/89	FY89: \$11,286	TOTAL: \$49,086
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Aber, J. D.	ARC/Peterson, D. L.	54-Env Biology
	ARC/Matson, P. A.	

NCC 2-27 University of New Hampshire - Durham 4304
Controlled ecology life support system workshops: The biological problems and experimental program

Period	Obligations	
10/01/79-11/30/89	FY89: \$62,296	TOTAL: \$961,373
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Moore, B.	ARC/MacElroy, R. D.	51-Biological Sci

NCC 8-5 University of New Hampshire - Durham 4305
Search for weak gamma ray bursts as coincident events on separate experiments

Period	Obligations	
05/19/88-10/03/89	FY89:	TOTAL: \$12,864
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Ryan, J. M.	MSFC/Wilson, R. B.	13-Physics
	MSFC/Fishman, G. J.	

NGL 30-002-021 University of New Hampshire - Durham 4306
Investigation and development of techniques for solar neutron and gamma ray detection

Period	Obligations	
02/28/66-01/31/90	FY89: \$174,937	TOTAL: \$2,714,362
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Chupp, E. L.	HQ-EZ/Kaluzienski, L. J.	11-Astronomy
Forrest, D. J.	HQ-EZ/Bunner, A. N.	

NGR 30-002-052 University of New Hampshire - Durham 4307
Research program in area of cosmic ray and X-ray astronomy

Period	Obligations	
02/12/70-09/31/89	FY89: \$154,000	TOTAL: \$2,422,558
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Webber, W. R.	HQ-ES/Mellott, M. M.	11-Astronomy
	HQ-ES/Perry, T. W.	

NGT 00-050-299 University of New Hampshire - Durham 4308
NASA graduate student researchers program

Period	Obligations	
08/01/88-07/31/90	FY89: \$17,890	TOTAL: \$35,420
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Arnoldy, R. L.	HQ-XE/Owens, F. C.	13-Physics

NGT 00-080-009 University of New Hampshire - Durham 4309
An international collaborative educational program in Earth systems science

Period	Obligations	
04/01/88-12/31/90	FY89: \$166,512	TOTAL: \$166,512
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Moore, E.	HQ-EE/Tilford, S. G.	31-Atmos Sci
Morrison, J. D.	HQ-EE/Lesane, G. A.	

NSG 7411 University of New Hampshire - Durham 4310
Theoretical studies in solar particle physics

Period	Obligations	
10/01/77-10/31/89	FY89: \$75,963	TOTAL: \$619,048
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hollweg, J.	HQ-EZ/Ahluwalia, H. S.	13-Physics
	HQ-ES/Kane, S.	

NSG 7481 University of New Hampshire - Durham 4311
Application of a double Compton telescope to measurements of the 1-15 MeV extra-terrestrial gamma rays

Period	Obligations	
03/01/78-01/31/88	FY89:	TOTAL: \$314,919
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Lockwood, J. A.	HQ-EZ/Kaluzienski, L. J.	11-Astronomy
Webber, W. R.	HQ-EZ/Cline, T. L.	

NEW JERSEY

NAG 1-494 Princeton University 4312
Study of a special-purpose Navier-Stokes computer

Period	Obligations	
07/01/84-09/30/90	FY89: \$100,013	TOTAL: \$1,786,192
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Nosenchuck, D. M.	LARC/Zang, T. A.	41-Aero Engr
Littman, M. G.	LARC/Kumar, A.	

**NASA'S UNIVERSITY PROGRAM
NEW JERSEY (Continued)**

NAG 1-726	Princeton University	4313	Computational reacting gas dynamics
<i>Period</i>	<i>Obligations</i>		
11/14/86-11/13/89	FY89: \$144,991	TOTAL: \$447,710	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Lam, S. H.	LARC/Gnoffo, P. A.	41-Aero Engr	
NAG 1-834	Princeton University	4314	Intelligent guidance and control for wind shear encounter
<i>Period</i>	<i>Obligations</i>		
11/12/87-01/31/90	FY89: \$72,170	TOTAL: \$142,170	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Stengel, R. F.	LARC/Hinton, D. A.	41-Aero Engr	
	LARC/Schutte, P. C.		
NAG 1-907	Princeton University	4315	Dynamics and control of an aerospace plane
<i>Period</i>	<i>Obligations</i>		
09/01/88-07/31/90	FY89: \$59,000	TOTAL: \$109,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Mease, K. D.	LARC/Moreder, D. D.	41-Aero Engr	
	LARC/Queen, E. M.		
NAG 1-961	Princeton University	4316	In plane streamline curvature effects on a turbulent boundary layer at Mach number of 3
<i>Period</i>	<i>Obligations</i>		
01/27/89-01/26/90	FY89: \$49,584	TOTAL: \$49,584	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Bogdonoff, S. M.	LARC/Anders, J. B.	41-Aero Engr	
NAG 1-1011	Princeton University	4317	High intensity ultra-violent flash lamp development for flow diagnostics
<i>Period</i>	<i>Obligations</i>		
05/01/89-11/30/89	FY89: \$59,890	TOTAL: \$59,890	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Miles, R. B.	LARC/Northam, G. B.	41-Aero Engr	
Lembert, W. R.			
NAG 1-1038	Princeton University	4318	Rotor inflow using a flat wake theory including correlation with experiment
<i>Period</i>	<i>Obligations</i>		
07/01/89-03/31/90	FY89: \$32,003	TOTAL: \$32,003	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Curtiss, H. C.	LARC/Wilson, J. C.	41-Aero Engr	
	LARC/Althoff, S. L.		
NAG 2-96	Princeton University	4319	Numerical calculation of transonic flows past complex aerodynamic configurations
<i>Period</i>	<i>Obligations</i>		
02/01/81-11/30/89	FY89: \$63,834	TOTAL: \$421,577	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Jameson, A.	ARC/Hicks, R. M.	41-Aero Engr	
Boker, T. J.	ARC/Cliiff, J. E.		
NAG 2-397	Princeton University	4320	Ionic mechanisms subserving mechano sensory transduction and neural integration in statocyst hair cells of hermissenda
<i>Period</i>	<i>Obligations</i>		
06/01/86-06/30/88	FY89:	TOTAL: \$126,689	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Farley, J.	ARC/Ross, M. D.	51-Biological Sci	
	ARC/Oyama, J.		
NAG 2-415	Princeton University	4321	Experimental studies in system identification of helicopter rotor dynamics
<i>Period</i>	<i>Obligations</i>		
09/01/86-08/31/89	FY89: \$59,704	TOTAL: \$169,518	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
McKillip, R. M.	ARC/Jacklin, S. A.	41-Aero Engr	
NAG 2-558	Princeton University	4322	Models for asynchronous mixed variable systems
<i>Period</i>	<i>Obligations</i>		
01/01/89-12/31/89	FY89: \$49,576	TOTAL: \$49,576	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Ramage, P.	ARC/Meyer, G.	49-Engr, NEC	
NAG 2-561	Princeton University	4323	Rotorcraft system identification
<i>Period</i>	<i>Obligations</i>		
02/01/89-01/31/90	FY89: \$51,094	TOTAL: \$51,094	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Curtiss, H. C.	ARC/Decker, W. A.	41-Aero Engr	
McKillup, R. M.	ARC/Tischler, M. B.		
NAG 3-259	Princeton University	4324	Behavior of fluid globules in external fields
<i>Period</i>	<i>Obligations</i>		
02/20/82-04/28/90	FY89: \$93,000	TOTAL: \$398,058	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Saville, D. A.	LERC/Chai, A. T.	13-Physics	
	LERC/Salzman, J. A.		
NAG 3-859	Princeton University	4325	Disorder order transitions in colloidal suspensions computer simulations and experimental observations
<i>Period</i>	<i>Obligations</i>		
01/20/88-02/19/90	FY89:	TOTAL: \$45,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Debenedetti, P. G.	LERC/Kiser, J. D.	43-Chem Engr	
Russel, W. B.			
NAG 3-915	Princeton University	4326	Optimal combination of orbit-changing mechanisms for space transportation
<i>Period</i>	<i>Obligations</i>		
06/15/88-06/25/90	FY89: \$77,097	TOTAL: \$152,097	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Mease, K.	LERC/Balkanyi, L. R.	42-Astro Engr	
Vinh, N. X.	LERC/Spurlock, O. F.		
NAG 3-926	Princeton University	4327	Crossing and reflecting three-dimensional shock waves
<i>Period</i>	<i>Obligations</i>		
08/15/88-08/15/90	FY89: \$48,000	TOTAL: \$128,026	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Bogdonoff, S. M.	LERC/Porto, A. R.	41-Aero Engr	
	LERC/Benson, T. J.		
NAG 3-965	Princeton University	4328	Mechanisms of combustion limits
<i>Period</i>	<i>Obligations</i>		
12/15/88-12/14/89	FY89: \$96,000	TOTAL: \$96,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Ronney, P. D.	LERC/Ross, H. D.	13-Physics	

**NASA'S UNIVERSITY PROGRAM
NEW JERSEY (Continued)**

NAG 3-1022 Princeton University 4329
NASA experimental and computational study of unsteady shock wave
Period Obligations
03/13/89-03/12/90 FY89: \$35,002 TOTAL: \$35,002
Prin. Invest. NASA Tech. Officer CASE Category
Smits, A. J. LERC/Hingst, W. R. 41-Aero Engr
LERC/Porro, A. R.

NAG 3-1032 Princeton University 4330
Turbulence modeling in shock wave turbulent boundary layer interactions
Period Obligations
04/05/89-04/04/91 FY89: \$42,000 TOTAL: \$42,000
Prin. Invest. NASA Tech. Officer CASE Category
Smith, A. J. LERC/Wang, C. R. 41-Aero Engr

NAG 3-1060 Princeton University 4331
Thermosoluted convection and macrosegregation in dendritic alloys
Period Obligations
06/15/89-07/17/90 FY89: \$60,000 TOTAL: \$60,000
Prin. Invest. NASA Tech. Officer CASE Category
Mease, K. D. LERC/Balkany, L. R. 42-Astro Engr
LERC/Spurlock, O. F.

NAG 3-1064 Princeton University 4332
Coaxial plasma thruster research
Period Obligations
10/01/89-09/30/90 FY89: \$300,000 TOTAL: \$300,000
Prin. Invest. NASA Tech. Officer CASE Category
Jahn, R. G. LERC/Byers, D. C. 42-Astro Engr
Kelly, A. J. LERC/Sovey, J. S.

NAG 5-616 Princeton University 4333
Interstellar medium absorption profile spectrograph (IMAPS)
Period Obligations
01/01/83-10/31/89 FY89: \$592,999 TOTAL: \$3,848,662
Prin. Invest. NASA Tech. Officer CASE Category
Jenkins, E. B. GSFC/Early, L. J. 13-Physics
GSFC/Pless, R. H.

NAG 5-899 Princeton University 4334
A terrestrial water balance for the first ISLSCP field experiment
Period Obligations
05/01/87-01/31/90 FY89: \$80,338 TOTAL: \$203,843
Prin. Invest. NASA Tech. Officer CASE Category
Milly, E. GSFC/Owe, M. 39-Env Sci, NEC
Wood, E. F. GSFC/Hall, F.

NAG 5-1004 Princeton University 4335
Interstellar lines in the spectrum of supernoun 1987a
Period Obligations
09/15/87-09/14/88 FY89: TOTAL: \$14,999
Prin. Invest. NASA Tech. Officer CASE Category
Jenkins, E. B. GSFC/Kondo, Y. 11-Astronomy

NAG 5-1014 Princeton University 4336
Low dispersion observations of bright stars
Period Obligations
10/15/87-10/14/89 FY89: TOTAL: \$39,953
Prin. Invest. NASA Tech. Officer CASE Category
Fitzpatrick, E. L. GSFC/Kondo, Y. 11-Astronomy
Bless, C.
Pitts, R. E.

NAG 5-1226 Princeton University 4337
Investigations of the infrared emission from elliptical galaxies
Period Obligations
09/01/89-11/30/89 FY89: \$9,700 TOTAL: \$9,700
Prin. Invest. NASA Tech. Officer CASE Category
Knapp, G. R. GSFC/West, D. 11-Astronomy

NAG 5-1258 Princeton University 4338
Analysis of pulsar timing data for gamma ray observatory
Period Obligations
09/01/89-05/31/90 FY89: \$48,784 TOTAL: \$48,784
Prin. Invest. NASA Tech. Officer CASE Category
Taylor, J. H. GSFC/Kniffen, D. A. 11-Astronomy
GSFC/Bertsch, D. L.

NAG 8-597 Princeton University 4339
The fluid mechanics of continuous flow electrophoresis
Period Obligations
08/25/86-08/24/89 FY89: TOTAL: \$200,000
Prin. Invest. NASA Tech. Officer CASE Category
Saville, D. A. MSFC/Phodes, P. H. 45-Elec Engr

NAG 8-749 Princeton University 4340
The roles of fluid motion and other transport phenomena in the morphology of materials
Period Obligations
09/01/88-08/31/89 FY89: TOTAL: \$135,000
Prin. Invest. NASA Tech. Officer CASE Category
Saville, D. A. MSFC/Snyder, R. S. 43-Chem Engr

NAGW 445 Princeton University 4341
Map galactic radiation at wave length = 1 cm
Period Obligations
06/01/83-03/31/88 FY89: \$2,649 TOTAL: \$418,046
Prin. Invest. NASA Tech. Officer CASE Category
Wilkinson, D. HQ-EZ/Boggess, N. W. 11-Astronomy
HQ-EZ/Weiler, E. J.

NAGW 477 Princeton University 4342
Copernicus data reduction and analysis
Period Obligations
09/01/83-06/30/90 FY89: TOTAL: \$327,353
Prin. Invest. NASA Tech. Officer CASE Category
Rogerson Jr., J. B. HQ-EZ/Stencel, R. E. 11-Astronomy
Spitzer Jr., L. HQ-EZ/Boggess, N. W.

NAGW 765 Princeton University 4343
The universe at moderate redshift
Period Obligations
07/01/85-04/30/90 FY89: \$270,000 TOTAL: \$1,174,418
Prin. Invest. NASA Tech. Officer CASE Category
Ostriker, J. P. HQ-EZ/Clayton, G. 11-Astronomy
HQ-EZ/Bunner, A. N.

NAGW 1392 Princeton University 4344
The influence of spatial variability and scale on the parameterization of hydrologic processes
Period Obligations
03/01/88-02/28/90 FY89: \$120,000 TOTAL: \$200,000
Prin. Invest. NASA Tech. Officer CASE Category
Wood, E. F. HQ-EE/Asrar, G. 99-Multi-Discip
HQ-EE/Ruzek, M.

**NASA'S UNIVERSITY PROGRAM
NEW JERSEY (Continued)**

NAGW 1482 Princeton University 4345
New radiometers for balloon-borne 3k isotropy experiment
Period Obligations
12/01/88-11/30/89 FY89: \$31,730 TOTAL: \$31,730
Prin. Invest. NASA Tech. Officer CASE Category
Wilkenson, D. T. HQ-EZ/Gillett, F. C. 13-Physics

NAS 5-33005 Princeton University 4353
Earth observing system interdisciplinary investigation
Period Obligations
08/28/89-12/14/90 FY89: \$10,000 TOTAL: \$10,000
Prin. Invest. NASA Tech. Officer CASE Category
Wood, E. F. GSFC/Soffen, G. 33-Oceanography

NAGW 1606 Princeton University 4346
Generation of the fields aligned current in the auroral zone
Period Obligations
03/01/89-02/28/90 FY89: \$59,950 TOTAL: \$59,950
Prin. Invest. NASA Tech. Officer CASE Category
Okuda, H. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Perry, T. W.

NCC 1-131 Princeton University 4354
Research in high-speed gas dynamics
Period Obligations
09/01/88-12/31/89 FY89: \$199,999 TOTAL: \$324,999
Prin. Invest. NASA Tech. Officer CASE Category
Bogdonoff, S. M. LARC/Dwoyer, D. L. 41-Aero Engr
LARC/Hefner, J. N.

NAGW 1763 Princeton University 4347
A statistical analysis of south polar sea ice formation
Period Obligations
06/01/89-12/31/89 FY89: \$39,407 TOTAL: \$39,407
Prin. Invest. NASA Tech. Officer CASE Category
Phelan, M. J. HQ-EE/Thomas, R. H. 33-Oceanography
De Veaux, R. D. HQ-EE/Wilson, W. S.

NCC 2-571 Princeton University 4355
Dynamic and kinetic sensitivity analysis
Period Obligations
10/01/88-12/31/89 FY89: \$5,000 TOTAL: \$5,000
Prin. Invest. NASA Tech. Officer CASE Category
Rabitz, H. ARC/Huo, W. M. 12-Chemistry

NAS 1-17234 Princeton University 4348
Inference of atmospheric parameters from shuttle upper atmosphere spectrometer (SUMS) experiment
Period Obligations
12/17/82-05/31/89 FY89: TOTAL: \$189,269
Prin. Invest. NASA Tech. Officer CASE Category
Cheng, S. I. LARC/Blanchard, R. C. 41-Aero Engr
LARC/Sutton, K.

NGL 31-001-007 Princeton University 4356
Theoretical and experimental studies of ultraviolet phenomena of astronomical interest and galactic gas dynamics
Period Obligations
05/06/83-01/31/90 FY89: \$65,342 TOTAL: \$2,462,985
Prin. Invest. NASA Tech. Officer CASE Category
Draine, B. T. HQ-EZ/Gillett, F. C. 11-Astronomy
HQ-EZ/Weiler, E. J.

NAS 3-24640 Princeton University 4349
Scientific support for a Space Shuttle droplet burning experiment
Period Obligations
05/29/85-11/20/91 FY89: \$219,941 TOTAL: \$929,669
Prin. Invest. NASA Tech. Officer CASE Category
Williams, F. A. LERC/Haggard, J. 49-Engr, NEC
Dryer, F. L.

NGL 31-001-252 Princeton University 4357
Air traffic control technology
Period Obligations
11/15/71-01/31/92 FY89: \$100,000 TOTAL: \$1,404,975
Prin. Invest. NASA Tech. Officer CASE Category
Stengel, R. F. LARC/Morrell, F. R. 41-Aero Engr
Sweet, L. M.

NAS 5-27590 Princeton University 4350
Provide pre-launch science data requirements and post launch data analysis for COBE
Period Obligations
05/31/83-05/30/91 FY89: \$55,000 TOTAL: \$248,150
Prin. Invest. NASA Tech. Officer CASE Category
Wilkenson, D. T. GSFC/Mather, J. 11-Astronomy

NGT 00-050-153 Princeton University 4358
NASA graduate student researchers program
Period Obligations
09/01/87-08/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Wood, E. F. HQ-XE/Owens, F. C. 32-Geological Sci

NAS 5-29142 Princeton University 4351
Follow on contract to NAS 5-25084 for the continuation of studies on the Hubble space telescope Goddard project
Period Obligations
06/19/85-06/19/90 FY89: \$61,000 TOTAL: \$538,000
Prin. Invest. NASA Tech. Officer CASE Category
Groth, E. J. GSFC/Kalinowski, K. 11-Astronomy

NGT 00-050-243 Princeton University 4359
NASA graduate student researchers program
Period Obligations
09/01/87-11/30/89 FY89: TOTAL: \$31,000
Prin. Invest. NASA Tech. Officer CASE Category
Sarmiento, J. HQ-XE/Owens, F. C. 19-Phys Sci, NEC

NAS 5-30110 Princeton University 4352
Space telescope imaging spectrograph program support
Period Obligations
06/17/87-10/30/89 FY89: \$34,000 TOTAL: \$53,000
Prin. Invest. NASA Tech. Officer CASE Category
Jenkins, E. GSFC/Vitaglino, D. 11-Astronomy

NGT 00-050-324 Princeton University 4360
NASA graduate student researchers program
Period Obligations
09/01/88-08/31/90 FY89: \$15,000 TOTAL: \$30,000
Prin. Invest. NASA Tech. Officer CASE Category
Pierrehumbert, R. T. HQ-XE/Owens, F. C. 31-Atmos Sci

**NASA'S UNIVERSITY PROGRAM
NEW JERSEY (Continued)**

NGT 00-050-373 Princeton University 4361
NASA graduate student researchers program
Period Obligations
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Dryer, F. L. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 00-050-425 Princeton University 4362
NASA graduate student researchers program
Period Obligations
09/01/89-08/31/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Sarmiento, J. HQ-XE/Owens, F. C. 12-Chemistry

NGT 00-070-146 Princeton University 4363
NASA graduate student researchers underrepresented minority focus program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Jahn, R. G. HQ-XE/Owens, F. C. 41-Aero Engr

NSG 5248 Princeton University 4364
Observational research on the IUE satellite
Period Obligations
03/01/78-10/31/88 FY89: TOTAL: \$93,941
Prin. Invest. NASA Tech. Officer CASE Category
Jenkins, E. B. GSFC/Kondo, Y. 11-Astronomy
Snow, T. P.
Joseph, C. L.

NSG 7302 Princeton University 4365
New radiometers for balloon 3 K isotropy experiment
Period Obligations
11/15/76-03/31/89 FY89: TOTAL: \$355,856
Prin. Invest. NASA Tech. Officer CASE Category
Wilkinson, D. T. HQ-EZ/Bogges, N. W. 11-Astronomy
HQ-EZ/Weiler, E. J.

NAG 3-956 Rutgers State University - Camden 4366
The effects of molecular structure on the electrical conductivity of polymers
Period Obligations
11/18/88-11/17/89 FY89: \$21,176 TOTAL: \$21,176
Prin. Invest. NASA Tech. Officer CASE Category
Burke, L. A. LERC/Meador, M. A. 12-Chemistry

NAG 9-26 Rutgers State University - New Brunswick 4367
Beryllium isotopes in meteorites
Period Obligations
02/01/83-03/01/90 FY89: \$45,622 TOTAL: \$203,745
Prin. Invest. NASA Tech. Officer CASE Category
Herzog, G. F. JSC/Browne, I. D. 11-Astronomy
Kruse, T. H.

NAG 9-35 Rutgers State University - New Brunswick 4368
Metal-silicate relationships in differentiated meteorites
Period Obligations
02/01/83-02/01/90 FY89: \$47,500 TOTAL: \$247,560
Prin. Invest. NASA Tech. Officer CASE Category
Hewins, R. H. JSC/Browne, I. D. 32-Geological Sci

NAG 9-304 Rutgers State University - New Brunswick 4369
Petrology of polymict breccias on the Moon and basaltic achondrite parent body
Period Obligations
08/01/88-08/01/90 FY89: \$16,000 TOTAL: \$34,466
Prin. Invest. NASA Tech. Officer CASE Category
Delaney, J. S. JSC/Browne, I. D. 32-Geological Sci

NGT 00-050-219 Rutgers State University - New Brunswick 4370
NASA graduate student researchers program
Period Obligations
09/02/87-09/01/89 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Hewins, R. HQ-XE/Owens, F. C. 12-Chemistry

NCA 2-424 Rutgers State University - Piscataway 4371
Crop production in a salad machine
Period Obligations
07/01/89-06/30/91 FY89: \$37,578 TOTAL: \$37,578
Prin. Invest. NASA Tech. Officer CASE Category
Janes, H. ARC/MacElroy, R. D. 55-Agriculture Sci

NAG 1-587 Stevens Institute of Technology 4372
Completion of ggloss gate level simulation language
Period Obligations
07/01/85-01/31/90 FY89: \$50,000 TOTAL: \$204,757
Prin. Invest. NASA Tech. Officer CASE Category
Swern, F. L. LARC/Bavuso, S. J. 29-Math/Cmputer,NEC
LARC/Pitts, F. L.

NGT 00-090-008 Stevens Institute of Technology 4373
Pre college outreach
Period Obligations
10/01/87-11/14/89 FY89: TOTAL: \$78,520
Prin. Invest. NASA Tech. Officer CASE Category
Prather, E. N. HQ-U/Margolis, M. S. 29-Math/Cmputer,NEC
HQ-U/Warren, L. S.

NAS 9-17276 Univ of Medicine And Dentistry 4374
Study of protein metabolism during space flight
Period Obligations
11/01/84-10/01/90 FY89: \$163,000 TOTAL: \$767,085
Prin. Invest. NASA Tech. Officer CASE Category
Stein, P. JSC/Newkirk, K. 56-Medical Sciences

NGT 00-070-033 Univ of Medicine And Dentistry 4375
Graduate student researchers underrepresented minority focus program
Period Obligations
06/15/87-06/14/89 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Stein, T. P. HQ-XE/Owens, F. C. 51-Biological Sci

**NASA'S UNIVERSITY PROGRAM
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NAG 5-767 New Mexico Institute of Mining & Tech 4376

Ultraviolet observations of selected astronomical sources

<i>Period</i>	<i>Obligations</i>	
05/01/86-09/07/90	FY89: \$51,400	TOTAL: \$137,415
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Shore, S. N.	GSFC/West, D.	11-Astronomy
Brown, D. N.		
Sonneborn, G.		

NAG 8-66 New Mexico Institute of Mining & Tech 4377

Cloud lightning observations from U2 aircraft

<i>Period</i>	<i>Obligations</i>	
05/12/86-01/31/90	FY89:	TOTAL: \$66,354
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Brook, M.	MSFC/Blakeslee, R.	45-Elec Engr
	MSFC/Christian, H. J.	

NAG 8-751 New Mexico Institute of Mining & Tech 4378

Aircraft measurements of electrified clouds at Kennedy Space Center

<i>Period</i>	<i>Obligations</i>	
09/01/88-08/31/90	FY89: \$189,424	TOTAL: \$317,071
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Jones, J. J.	MSFC/Christian, H. J.	31-Atmos Sci

NAGW 1591 New Mexico Institute of Mining & Tech 4379

Magnetic fields and central structure in the hot gas in clusters of galaxies

<i>Period</i>	<i>Obligations</i>	
02/01/89-01/31/90	FY89: \$34,000	TOTAL: \$34,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Eilek, J. A.	HQ-EZ/Kaluzienski, L. J.	11-Astronomy
	HQ-EZ/Bunner, A. N.	

NCA 2-408 New Mexico Institute of Mining & Tech 4380

Electrical properties of Titan's atmosphere- instrument feasibility study

<i>Period</i>	<i>Obligations</i>	
05/15/89-10/15/89	FY89: \$10,000	TOTAL: \$10,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Winn, W. P.	ARC/Borucki, W. J.	19-Phys Sci, NEC
Moore, C. B.		

NCA 5-71 New Mexico Institute of Mining & Tech 4381

Cometary and astrophysical research activities

<i>Period</i>	<i>Obligations</i>	
11/01/76-09/30/89	FY89: \$25,000	TOTAL: \$443,320
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Shore, S. N.	GSFC/Niedier, M.	11-Astronomy
Holmes, C. R.		

NCC 2-364 New Mexico Institute of Mining & Tech 4382

Evolution of photon and particle spectra in compact luminous objects

<i>Period</i>	<i>Obligations</i>	
08/01/85-02/28/90	FY89: \$13,000	TOTAL: \$49,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Eilek, J. A.	ARC/Witteborn, F. C.	11-Astronomy

NAG 2-453 New Mexico State University - Las Cruces 4383

A formal method for knowledge elicitation and representation applied to the design of Numan computer interfaces

<i>Period</i>	<i>Obligations</i>	
07/01/87-06/30/89	FY89: \$78,814	TOTAL: \$234,799
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Papp, K. R.	ARC/Remington, R.	69-Psych, NEC
McDonald, J. E.	ARC/Shafro, M. G.	
Schaneveldt, R. W.		

NAG 2-474 New Mexico State University - Las Cruces 4384

Transient multigrid methods for the floating point T100 hypercube

<i>Period</i>	<i>Obligations</i>	
09/01/87-05/31/89	FY89:	TOTAL: \$25,242
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hills, R. G.	ARC/Stevens, K. G.	22-Computer Science

NAG 2-543 New Mexico State University - Las Cruces 4385

Associative network databases

<i>Period</i>	<i>Obligations</i>	
07/01/88-09/30/89	FY89: \$44,933	TOTAL: \$44,933
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Paap, K. R.	ARC/Hofstrand, R. F.	69-Psych, NEC
Dearholt, D. W.		
Mc donald, T. E.		

NAG 5-847 New Mexico State University - Las Cruces 4386

Astromog prototype multiwire proportional chambers

<i>Period</i>	<i>Obligations</i>	
09/15/86-09/14/89	FY89:	TOTAL: \$92,887
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Golden, R. L.	GSFC/Ormes, J. F.	42-Astro Engr

NAG 9-396 New Mexico State University - Las Cruces 4387

A continuing study of lunar astronomical observatories

<i>Period</i>	<i>Obligations</i>	
07/01/89-07/01/90	FY89: \$58,712	TOTAL: \$58,712
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Burns, J. O.	JSC/Thompson, D.	11-Astronomy

NAGW 110 New Mexico State University - Las Cruces 4388

Continuation of a cosmic ray research program using a superconducting magnet spectrometer

<i>Period</i>	<i>Obligations</i>	
08/01/80-12/31/89	FY89: \$205,667	TOTAL: \$1,272,222
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Golden, R. L.	HQ-ES/Mellott, M. M.	11-Astronomy
	HQ-ES/Jones, W. V.	

NAGW 1172 New Mexico State University - Las Cruces 4389

Analysis of Voyager Z data of the atmosphere of Uranus

<i>Period</i>	<i>Obligations</i>	
10/01/87-09/30/89	FY89:	TOTAL: \$38,910
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Beebe, R.	HQ-EL/Quaide, W. L.	19-Phys Sci, NEC
	HQ-EL/Fox, K.	

NASA'S UNIVERSITY PROGRAM **NEW MEXICO (Continued)**

NAGW 1418 New Mexico State University - Las Cruces 4390

Operation of the New Mexico State University balloon borne superconducting magnet as a cosmic ray observatory

<i>Period</i>	<i>Obligations</i>	
08/01/88-06/30/90	FY89: \$229,374	TOTAL: \$380,881
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Golden, R. L.	HQ-ES/Mellott, M. M.	13-Physics
	HQ-ES/Jones, W. V.	

NAGW 1449 New Mexico State University - Las Cruces 4391

Processing of NASA imaging on an IBM-AT prototype system

<i>Period</i>	<i>Obligations</i>	
09/01/88-08/31/89	FY89:	TOTAL: \$40,472
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Beebe, R.	HQ-EL/Fox, K.	19-Phys Sci, NEC

NAGW 1506 New Mexico State University - Las Cruces 4392

Analysis of high resolution Jupiter Voyager data

<i>Period</i>	<i>Obligations</i>	
01/01/89-12/31/89	FY89: \$36,349	TOTAL: \$36,349
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Beebe, R. F.	HQ-EL/Bergstrahl, J. T.	11-Astronomy

NAGW 1592 New Mexico State University - Las Cruces 4393

High level cognitive information processing in neural networks

<i>Period</i>	<i>Obligations</i>	
01/01/89-12/31/89	FY89: \$138,119	TOTAL: \$138,119
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Barnden, J. A.	HQ-E/Alexander, J. K.	29-Math/Computer, NEC
	HQ-E/Holland, D. A.	

NAGW 1746 New Mexico State University - Las Cruces 4394

Center for space telemetering and telecommunication systems

<i>Period</i>	<i>Obligations</i>	
06/01/89-12/31/90	FY89: \$1,000,000	TOTAL: \$1,000,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Carden, F.	HQ-TC/Dapice, R. R.	99-Multi-Discip
Horan, S.		
Shay, T.		

NAGW 1802 New Mexico State University - Las Cruces 4395

Long term changes in reflectivity and large scale motions in the atmospheres of Jupiter and Saturn

<i>Period</i>	<i>Obligations</i>	
10/01/89-09/30/90	FY89: \$66,774	TOTAL: \$66,774
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Reebe, R.	HQ-EL/Rahe, J.	11-Astronomy

NAS 5-26662 New Mexico State University - Las Cruces 4396

Provide developmental and technological support for the ultraviolet imaging telescope (UIT) shuttle electronics

<i>Period</i>	<i>Obligations</i>	
08/12/81-03/31/89	FY89: \$4,800	TOTAL: \$648,499
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Gilcrease, A.	GSFC/Blum, A.	45-Elec Engr

NAS 5-28928 New Mexico State University - Las Cruces 4397

Field and analytical engineering support

<i>Period</i>	<i>Obligations</i>	
05/01/85-04/30/90	FY89: \$1,806,897	TOTAL: \$7,824,761
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Lane, K.	GSFC/West, W. W.	41-Aero Engr
	GSFC/Powell, W. R.	

NAS 5-29149 New Mexico State University - Las Cruces 4398

Spartan/gas/shuttle related programs engineering support

<i>Period</i>	<i>Obligations</i>	
05/16/85-04/30/90	FY89: \$3,556,593	TOTAL: \$11,950,602
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Bawcom, D.	GSFC/Pincus, B. R.	49-Engr, NEC
Connell, H. L.		
Islas, S. W.		

NAS 5-29800 New Mexico State University - Las Cruces 4399

Operation and maintenance of the national scientific balloon facility

<i>Period</i>	<i>Obligations</i>	
10/01/87-09/30/90	FY89: \$12,069,618	TOTAL: \$26,914,530
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Halligan, J. E.	GSFC/Nock, R. S.	39-Env Sci, NEC
	GSFC/Needleman, H. C.	

NAS 5-30105 New Mexico State University - Las Cruces 4400

Provide support to the SSBVU experiment

<i>Period</i>	<i>Obligations</i>	
05/01/87-04/30/90	FY89: \$10,000	TOTAL: \$35,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Unavailable	GSFC/Cannon, R.	41-Aero Engr

NAS 9-95618 New Mexico State University - Las Cruces 4401

NASA/JSC White Sands test facility data analysis and development system DADS

<i>Period</i>	<i>Obligations</i>	
09/23/88-12/31/89	FY89: \$5,014	TOTAL: \$550,584
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Craddock, W. L.	JSC/Lerdal, R.	22-Computer Science

NCA 2-328 New Mexico State University - Las Cruces 4402

Preliminary evaluation of waste processing in a CELSS

<i>Period</i>	<i>Obligations</i>	
07/01/88-06/30/89	FY89:	TOTAL: \$6,560
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Jacquez, R. B.	ARC/Wydeven, T.	44-Civil Engr

NCC 5-40 New Mexico State University - Las Cruces 4403

Telemetry downlink interfaces level-zero processing

<i>Period</i>	<i>Obligations</i>	
10/01/88-09/30/91	FY89: \$97,377	TOTAL: \$597,380
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Pfeiffer, J.	GSFC/Smith, G. A.	41-Aero Engr
Horan, S.	GSFC/Pritchard, J. A.	
Taylor, J. M.		

**NASA'S UNIVERSITY PROGRAM
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NGL 32-003-001 New Mexico State University - Las Cruces 4404

Photographic patrol and study of physical conditions on the Moon and planets

<i>Period</i>	<i>Obligations</i>	
04/15/61-09/30/90	FY89: \$4,987	TOTAL: \$2,440,084
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Beebe, R. F.	HQ-EL/Brinton, H. C.	11-Astronomy
Van Aken, J. M.	HQ-EL/Rahe, J. H.	

NGT 00-070-070 New Mexico State University - Las Cruces 4405

Graduate student researchers underrepresented minority focus program

<i>Period</i>	<i>Obligations</i>	
01/01/88-12/31/89	FY89: \$18,000	TOTAL: \$36,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hills, R. G.	HQ-XE/Owens, F. C.	46-Mech Engr

NGT 00-070-079 New Mexico State University - Las Cruces 4406

Graduate student researchers underrepresented minority focus program

<i>Period</i>	<i>Obligations</i>	
07/06/87-07/05/90	FY89: \$18,000	TOTAL: \$54,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Becker, J. F.	HQ-XE/Owens, F. C.	22-Computer Science
Paap, K.		

NGT 00-070-113 New Mexico State University - Las Cruces 4407

NASA graduate student minority program

<i>Period</i>	<i>Obligations</i>	
01/01/89-12/31/89	FY89: \$18,000	TOTAL: \$18,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Jacquez, R. B.	HQ-XE/Owens, F. C.	45-Elec Engr

NGT 00-070-114 New Mexico State University - Las Cruces 4408

NASA graduate student minority program

<i>Period</i>	<i>Obligations</i>	
01/01/89-12/31/89	FY89: \$18,000	TOTAL: \$18,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Jacquez, R. B.	HQ-XE/Owens, F. C.	44-Civil Engr

NAG 8-130 San Juan College 4409

Theoretical investigation of solar wind phenomena

<i>Period</i>	<i>Obligations</i>	
04/17/89-04/17/90	FY89: \$10,000	TOTAL: \$10,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Nerney, S. F.	MSFC/Suess, S. T.	49-Engr, NEC

NAGW 1468 University of Albuquerque 4410

Basic problems in solar and heliospheric physics

<i>Period</i>	<i>Obligations</i>	
10/01/88-09/30/89	FY89: \$161,838	TOTAL: \$161,838
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Ahluwalia, H. S.	HQ-ES/Bohlin, J. D.	19-Phys Sci, NEC

NAG 3-941 University of New Mexico 4411

Transient behavior of heat pipes including startup from a frozen state

<i>Period</i>	<i>Obligations</i>	
12/01/88-11/30/91	FY89: \$50,000	TOTAL: \$50,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Elgenk, M.	LERC/Juhasz, A. J.	46-Mech Engr
	LERC/Baker, K. W.	

NAG 3-992 University of New Mexico 4412

Conceptual studies on integration of nuclear reactor systems to manned rover for Mars mission

<i>Period</i>	<i>Obligations</i>	
02/01/89-01/31/90	FY89: \$50,000	TOTAL: \$50,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
El Genk, M. S.	LERC/Cataldo, R. L.	49-Engr, NEC
	LERC/Hickman, J. M.	

NAG 3-1045 University of New Mexico 4413

Experimental and theoretical studies for the flow of lithium coolant during start up and restart of the sp 100 system

<i>Period</i>	<i>Obligations</i>	
05/08/89-05/07/92	FY89: \$66,000	TOTAL: \$66,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
El Genk, M. S.	LERC/Acevedo, J. C.	49-Engr, NEC
	LERC/Smith, J. M.	

NAG 5-851 University of New Mexico 4414

Analysis of decertification processes in the American southwest

<i>Period</i>	<i>Obligations</i>	
09/15/86-02/28/90	FY89: \$53,000	TOTAL: \$276,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Morain, S. A.	GSFC/Oseroff, H.	19-Phys Sci, NEC

NAG 5-1026 University of New Mexico 4415

Ground based studies of radio and infrared emissions from the planet Mercury

<i>Period</i>	<i>Obligations</i>	
12/15/87-12/31/89	FY89: \$21,179	TOTAL: \$42,059
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Burns, J. O.	GSFC/Baker, D. N.	13-Physics
Zeilik, M.		
Gisler, G.		

NAG 5-1239 University of New Mexico 4416

Multi-wavelength studies of star formation in IRAS-observed spiral galaxies

<i>Period</i>	<i>Obligations</i>	
08/15/89-02/14/90	FY89: \$19,200	TOTAL: \$19,200
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Duric, N.	GSFC/West, D.	11-Astronomy

NAG 8-668 University of New Mexico 4417

X ray emission from poor clusters of galaxies

<i>Period</i>	<i>Obligations</i>	
07/15/87-02/14/89	FY89:	TOTAL: \$29,635
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Halpern, J.	MSFC/Harper, B. A.	11-Astronomy

NAG 8-747 University of New Mexico 4418

Analysis and modeling of X ray emission from dominant galaxies

<i>Period</i>	<i>Obligations</i>	
07/01/88-06/30/90	FY89: \$64,874	TOTAL: \$64,874
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Burns, J. O.	MSFC/Havrisik, D.	11-Astronomy
Sulkaneh, M. E.		

NAG 9-30 University of New Mexico 4419

The formation and evolution of stony meteorites

<i>Period</i>	<i>Obligations</i>	
02/15/83-12/01/89	FY89: \$334,912	TOTAL: \$1,758,532
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Keil, K.	JSC/Browne, I. D.	32-Geological Sci
Taylor, G. J.		
Scott, E. R.		

NASA'S UNIVERSITY PROGRAM **NEW MEXICO (Continued)**

NAG 9-160 University of New Mexico 4420
Analytical electron microscopy of fine-grained phases in primitive interplanetary dust particles and carbonaceous chondrites
Period *Obligations*
04/01/86-04/01/90 FY89: \$100,000 TOTAL: \$340,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Rietmeijer, F. J. JSC/Browne, I. D. 32-Geological Sci

NAG 9-245 University of New Mexico 4421
Astronomical observatories on the Moon
Period *Obligations*
07/15/87-01/01/90 FY89: \$17,500 TOTAL: \$140,108
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Burns, J. O. JSC/Duke, M. B. 42-Astro Engr
Taylor, G. J. JSC/Roberts, B. B.
Johnson, S.

NAG 9-354 University of New Mexico 4422
Geological and other scientific requirements in future lunar exploration
Period *Obligations*
05/01/89-04/30/90 FY89: \$25,000 TOTAL: \$25,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Taylor, G. J. JSC/Duke, M. 32-Geological Sci

NASW 4191 University of New Mexico 4423
Operation of technology application center for dissemination of NASA technology
Period *Obligations*
07/01/86-06/30/90 FY89: \$385,016 TOTAL: \$959,471
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Morain, S. A. HQ/Bivins, R. 99-Multi-Discip

NGR 32-004-062 University of New Mexico 4424
Search for evidence of dynamic process
Period *Obligations*
06/22/70-09/30/89 FY89: \$83,184 TOTAL: \$520,474
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Elston, W. E. HQ-EL/Underwood, J. 32-Geological Sci
HQ-EL/Boyce, J. M.

NGT 00-070-003 University of New Mexico 4425
Graduate student researchers underrepresented minority focus program
Period *Obligations*
01/01/87-12/31/89 FY89: \$17,226 TOTAL: \$49,665
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Grover, H. D. HQ-LE/Owens, F. C. 32-Geological Sci

NGT 32-004-770 University of New Mexico 4426
A preoperative education program
Period *Obligations*
07/25/77-06/30/90 FY89: \$153,128 TOTAL: \$439,439
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lee, M. HQ-U/Gutierrez, O. A. 49-Engr, NEC

NEW YORK

NCC 3-59 Alfred University 4427
Interfacial bond characterization ceramic composites
Period *Obligations*
03/01/86-02/27/88 FY89: TOTAL: \$42,912
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Laughner, J. W. LARC/Shaw, N. J. 47-Materials Engr
LARC/Dicarlo, J. A.

NAG 1-1028 Brooklyn College 4428
Photorefectance for in-situ characterization of MOCVD growth semiconductors under micro-gravity
Period *Obligations*
07/17/89-04/16/90 FY89: \$30,000 TOTAL: \$30,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Pollak, F. H. LARC/Clark, I. O. 19-Phys Sci, NEC

NAGW 1704 Brooklyn College 4429
Development maturation and physiology of the brain pituitary genad axis of fish in the cebas aquarack system
Period *Obligations*
02/01/89-01/31/90 FY89: \$49,996 TOTAL: \$49,996
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Schreibman, M. P. HQ-EB/Halstead, T. W. 51-Biological Sci

NGT 00-050-533 Brooklyn College 4430
NASA graduate student researchers program
Period *Obligations*
06/01/89-05/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Harrow, K. HQ-XE/Owens, F. C. 22-Computer Science

NAG 1-377 City College of New York 4431
The measurement of Reynolds stresses in turbulent compressible flow
Period *Obligations*
06/01/83-09/30/89 FY89: TOTAL: \$1,150,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Johnson, J. A., III LARC/Budhnell, D. M. 41-Aero Engr
LARC/Anders, J. B.

NAG 1-810 City College of New York 4432
Nonradiative relaxation and laser action in tunable solid state laser crystals
Period *Obligations*
09/01/87-01/31/90 FY89: \$19,000 TOTAL: \$39,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Alfano, R. R. LARC/Allario, F. 13-Physics
LARC/Byvik, C. E.

NCA 2-89 City College of New York 4433
Turbulent transport processes in the primordial solar nebula
Period *Obligations*
11/01/85-09/30/87 FY89: TOTAL: \$65,115
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lea, R. M. ARC/Pollack, J. B. 13-Physics
ARC/Cassen, P. M.

NCA 2-186 City College of New York 4434
Can a binary system have a circumstellar disk
Period *Obligations*
12/15/86-09/30/88 FY89: TOTAL: \$10,500
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Yuan, C. ARC/Cassen, P. 11-Astronomy

NGT 00-070-026 City College of New York 4435
Graduate student researchers underrepresented minority focus program
Period *Obligations*
09/01/87-08/31/90 FY89: TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Alfano, R. R. HQ-XE/Owens, F. C. 45-Elec Engr

**NASA'S UNIVERSITY PROGRAM
NEW YORK (Continued)**

NGT 00-070-046 City College of New York 4436
NASA graduate student researchers program
Period Obligations
09/01/87-08/31/89 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Raj, R. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 00-070-053 City College of New York 4437
NASA graduate student researchers program
Period Obligations
10/01/87-09/30/89 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Johnson, J. A. HQ-XE/Owens, F. C. 13-Physics

NGT 00-070-084 City College of New York 4438
Graduate student researchers underrepresented minority focus program
Period Obligations
09/01/88-02/28/90 FY89: TOTAL: \$15,120
Prin. Invest. NASA Tech. Officer CASE Category
Pierson, W. J. HQ-XE/Owens, F. C. 99-Multi-Discip

NGT 00-070-098 City College of New York 4439
NASA graduate student researchers program
Period Obligations
09/01/88-08/31/90 FY89: \$14,238 TOTAL: \$14,238
Prin. Invest. NASA Tech. Officer CASE Category
Pierson, W. J. HQ-XE/Owens, F. C. 13-Physics

NAGW 690 City University of New York System 4440
Remote sensing research on radar backscatters theory and on improving conventional methods for measuring winds at sea by means of the Seasat SASS data and comparison data sets
Period Obligations
12/01/84-11/30/89 FY89: \$120,000 TOTAL: \$579,979
Prin. Invest. NASA Tech. Officer CASE Category
Pierson, W. J. HQ-EE/Lagerloef, G. S. 33-Oceanography
HQ-EE/Wilson, W. S.

NAG 1-397 Clarkson University 4441
Bridgman crystal growth
Period Obligations
08/05/83-10/31/89 FY89: TOTAL: \$331,019
Prin. Invest. NASA Tech. Officer CASE Category
Carlson, F. M. LARC/Fripp, A. L. 47-Materials Engr
LARC/Clark, I. O.

NAG 3-818 Clarkson University 4442
Computer aided modeling and prediction of performance of the modified Lundell class of alternators in space station solar dynamics power systems
Period Obligations
08/26/87-11/17/89 FY89: \$35,000 TOTAL: \$211,184
Prin. Invest. NASA Tech. Officer CASE Category
Demerdash, N. A. LERC/Secunde, R. R. 45-Elec Engr
LERC/Hojnicki, J. S.

NAG 8-541 Clarkson University 4443
Modelling directional solidification
Period Obligations
09/01/85-07/31/89 FY89: TOTAL: \$280,000
Prin. Invest. NASA Tech. Officer CASE Category
Wilcox, W. R. MSFC/Grant, H. 43-Chem Engr

NAG 8-753 Clarkson University 4444
Influence of convection on microstructures
Period Obligations
08/15/88-08/14/89 FY89: \$84,904 TOTAL: \$84,904
Prin. Invest. NASA Tech. Officer CASE Category
Wilcox, W. R. MSFC/Szofran, F. R. 13-Physics
MSFC/Cobb, S. D.

NAGW 910 Clarkson University 4445
Zonally averaged model of dynamics chemistry and radiation for the atmosphere
Period Obligations
07/01/86-11/30/88 FY89: TOTAL: \$315,044
Prin. Invest. NASA Tech. Officer CASE Category
Tung, K. K. HQ-EE/Miller, T. L. 31-Atmos Sci
HQ-EE/Prather, M. J.

NAGW 976 Clarkson University 4446
Establishment of a center for the commercial development of space
Period Obligations
09/01/86-12/31/89 FY89: \$1,142,000 TOTAL: \$3,142,000
Prin. Invest. NASA Tech. Officer CASE Category
Wilcox, W. R. HQ-IC/Oran, W. 51-Biological Sci
Hoekstra, B. HQ/Whitten, R. P.

NAS 8-32944 Clarkson University 4447
Experiment for materials processing in space, physical phenomena in containerless glass processing
Period Obligations
02/23/78-01/31/90 FY89: \$95,471 TOTAL: \$1,259,973
Prin. Invest. NASA Tech. Officer CASE Category
Subramanian, R. S. MSFC/Fogle, V. 13-Physics
Cole, R. MSFC/Johnson, J. L.

NGT 00-050-212 Clarkson University 4448
NASA graduate student researchers program
Period Obligations
06/01/87-05/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Subramanian, R. S. HQ-XE/Owens, F. C. 43-Chem Engr

NGT 00-050-213 Clarkson University 4449
NASA graduate student researchers program
Period Obligations
06/01/87-05/31/90 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Subramanian, R. S. HQ-XE/Owens, F. C. 43-Chem Engr

NGT 00-050-310 Clarkson University 4450
NASA graduate student researchers program
Period Obligations
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Wilcox, W. R. HQ-XE/Owens, F. C. 43-Chem Engr

NGT 33-011-801 Clarkson University 4451
NASA graduate student researchers program
Period Obligations
05/15/85-09/15/88 FY89: TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Subramanian, R. S. HQ-LE/Owens, F. C. 43-Chem Engr

**NASA'S UNIVERSITY PROGRAM
NEW YORK (Continued)**

NAG 1-427 Columbia University 4452
Development of smoothly embedable strut nacelle grids
Period Obligations
11/21/83-11/30/89 FY89: \$28,750 TOTAL: \$172,750
Prin. Invest. NASA Tech. Officer CASE Category
Eiseman, P. R. LARC/Smith Jr., R. E. 29-Math/Computer, NEC
Chu, C. K. LARC/Shoosmith, J. N.

NAG 1-649 Columbia University 4453
Nonlinear large angle maneuvers of flexible space structures
Period Obligations
03/01/86-12/31/89 FY89: \$118,000 TOTAL: \$262,577
Prin. Invest. NASA Tech. Officer CASE Category
Longman, R. W. LARC/Juang, J. N. 42-Astro Engr
LARC/Belvin, W. K.

NAG 1-653 Columbia University 4454
Ground truth for the international satellite cloud climatology project (ISCCP) algorithm
Period Obligations
03/06/86-12/05/89 FY89: \$60,999 TOTAL: \$204,097
Prin. Invest. NASA Tech. Officer CASE Category
Kukla, G. LARC/McDougal, D. S. 31-Atmos Sci
Robinson, D. LARC/Owens, T. L.

NAG 2-385 Columbia University 4455
Effects of simulated microgravity of mammalian development and expression of calcium binding properties
Period Obligations
11/01/85-10/31/88 FY89: TOTAL: \$170,173
Prin. Invest. NASA Tech. Officer CASE Category
Wolgemuth, D. I. ARC/Ross, M. D. 51-Biological Sci
ARC/Oyama, J.

NAG 2-597 Columbia University 4456
Gene expression in testis of rats flown on Cosmos flight of 1989
Period Obligations
06/01/89-10/31/89 FY89: \$5,000 TOTAL: \$5,000
Prin. Invest. NASA Tech. Officer CASE Category
Wolgemuth, D. J. ARC/Grindeland, R. E. 56-Medical Sciences

NAG 3-720 Columbia University 4457
Interdiffusion interactions in W fiber NBZA and intermetallic berylline compound composites for use in the SP 100 program
Period Obligations
06/15/86-01/14/89 FY89: TOTAL: \$132,866
Prin. Invest. NASA Tech. Officer CASE Category
Tien, J. K. LERC/Petrasek, D. W. 47-Materials Engr
Kopp, M. LERC/Brindley, P. K.
Caulfield, T.

NAG 3-877 Columbia University 4458
Grid generation for turbomachinery by using a control point form
Period Obligations
02/25/88-11/25/89 FY89: \$60,000 TOTAL: \$90,000
Prin. Invest. NASA Tech. Officer CASE Category
Eiseman, P. R. LERC/Choo, Y. K. 29-Math/Computer, NEC

NAG 3-936 Columbia University 4459
Ion implanted diffusion barriers
Period Obligations
10/15/88-10/15/89 FY89: \$62,547 TOTAL: \$62,547
Prin. Invest. NASA Tech. Officer CASE Category
Tien, J. K. LERC/Grobstein, T. L. 47-Materials Engr
LERC/Petrasek, D. W.

NAG 5-618 Columbia University 4460
X-ray astronomy
Period Obligations
02/01/83-12/31/89 FY89: \$748,482 TOTAL: \$4,239,667
Prin. Invest. NASA Tech. Officer CASE Category
Novick, R. GSFC/Early, L. J. 13-Physics
H-m Ku, W. GSFC/Pless, R. H.
Vartanian, M.

NAG 5-642 Columbia University 4461
High emission line spectroscopy
Period Obligations
04/01/87-03/31/90 FY89: \$268,000 TOTAL: \$556,952
Prin. Invest. NASA Tech. Officer CASE Category
Martin, C. GSFC/Early, L. J. 13-Physics
GSFC/Pless, R. H.

NAG 5-799 Columbia University 4462
Inter and intra plate deformation at North American plate boundaries
Period Obligations
07/01/86-07/31/90 FY89: \$69,995 TOTAL: \$280,396
Prin. Invest. NASA Tech. Officer CASE Category
Beavan, J. GSFC/Frey, H. V. 32-Geological Sci
Bilham, R.

NAG 5-823 Columbia University 4463
Ultraviolet observations of selected astimmical sources
Period Obligations
07/01/86-08/31/88 FY89: TOTAL: \$93,500
Prin. Invest. NASA Tech. Officer CASE Category
Halpern, J. P. GSFC/Kondo, Y. 11-Astronomy
Edelson, R. A.
Monier, R.

NAG 5-827 Columbia University 4464
Pseudo white dwarfs in cataclysmic variables
Period Obligations
07/15/86-08/14/88 FY89: TOTAL: \$26,040
Prin. Invest. NASA Tech. Officer CASE Category
Patterson, J. O. GSFC/Kondo, Y. 11-Astronomy

NAG 5-920 Columbia University 4465
Role of regional stresses in the development of the Arabian plate
Period Obligations
06/01/87-05/31/89 FY89: TOTAL: \$94,818
Prin. Invest. NASA Tech. Officer CASE Category
Cochran, J. R. GSFC/Walker, J. E. 32-Geological Sci

NAG 5-967 Columbia University 4466
Anomalous ultraviolet extinction at the galactic poles
Period Obligations
08/15/87-08/14/88 FY89: TOTAL: \$15,900
Prin. Invest. NASA Tech. Officer CASE Category
Martin, C. GSFC/Kondo, Y. 11-Astronomy
Basri, G.
Finley, D. S.

NAG 5-991 Columbia University 4467
Low redshift quasar lyman leniut absorption systems
Period Obligations
08/15/87-08/14/88 FY89: TOTAL: \$26,000
Prin. Invest. NASA Tech. Officer CASE Category
Tytler, D. GSFC/Kondo, Y. 11-Astronomy

**NASA'S UNIVERSITY PROGRAM
NEW YORK (Continued)**

NAG 5-1082	Columbia University	4468	Establishment of a Global Positioning System Geotelic network in the southern Aegean sea
<i>Period</i>	<i>Obligations</i>		
09/15/88-06/14/90	FY89: \$104,692	TOTAL: \$146,579	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Kastens, K. A.	GSFC/Welker, J. E.	31-Atmos Sci	
NAG 5-1136	Columbia University	4469	Asthenosphere dynamics the effects of viscosity and compositional stratification on convection beneath the oceanic lithosphere
<i>Period</i>	<i>Obligations</i>		
06/15/89-06/14/90	FY89: \$31,611	TOTAL: \$31,611	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Haxby, W. F.	GSFC/Welker, J. E.	32-Geological Sci	
NAG 5-1140	Columbia University	4470	Search for correlated ultraviolet and X ray absorption in a selected Seyfert galaxy
<i>Period</i>	<i>Obligations</i>		
06/15/89-06/14/90	FY89: \$26,341	TOTAL: \$26,341	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Martin, C.	GSFC/West, D. K.	11-Astronomy	
NAG 5-1144	Columbia University	4471	Ultraviolet spectroscopy of galactic globular clusters
<i>Period</i>	<i>Obligations</i>		
06/15/89-06/14/90	FY89: \$15,200	TOTAL: \$15,200	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Rich, R.	GSFC/West, D. K.	11-Astronomy	
NAG 5-1240	Columbia University	4472	Strong associated carbon IV absorption in low redshift quasars
<i>Period</i>	<i>Obligations</i>		
09/01/89-11/30/89	FY89: \$34,500	TOTAL: \$34,500	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Tytler, D.	GSFC/West, D. K.	11-Astronomy	
NAG 8-497	Columbia University	4473	Analysis and interpretation of data from the Einstein Observatory (HEAO-2)
<i>Period</i>	<i>Obligations</i>		
10/01/84-09/30/89	FY89: \$250,000	TOTAL: \$1,375,075	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Novick, R.	MSFC/Havrisik, D.	11-Astronomy	
Helfand, D. J.			
NAG 8-661	Columbia University	4474	SADAP analysis rapid periodicities in cataclysmic variables
<i>Period</i>	<i>Obligations</i>		
08/01/87-07/31/88	FY89:	TOTAL: \$31,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Patterson, J.	MSFC/Harper, B. A.	11-Astronomy	
NAG 8-664	Columbia University	4475	A SADAP study of the interstellar medium of the large Magellanic cloud
<i>Period</i>	<i>Obligations</i>		
08/01/87-07/31/90	FY89: \$31,000	TOTAL: \$92,200	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Helfand, D. J.	MSFC/Havrisik, D. M.	11-Astronomy	
NAG 8-728	Columbia University	4476	Rapid periodicities in cataclysmic variables
<i>Period</i>	<i>Obligations</i>		
06/01/88-05/31/89	FY89: \$45	TOTAL: \$19,395	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Patterson, J.	MSFC/Harper, B.	11-Astronomy	
NAG 8-729	Columbia University	4477	X ray spectra of cataclysmic variables
<i>Period</i>	<i>Obligations</i>		
06/01/88-05/31/90	FY89: \$29,970	TOTAL: \$63,503	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Patterson, J.	MSFC/Havrisik, D.	11-Astronomy	
NAG 8-740	Columbia University	4478	X ray properties of liners
<i>Period</i>	<i>Obligations</i>		
07/01/88-06/30/89	FY89:	TOTAL: \$41,876	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Halpern, J.	MSFC/Harper, B.	11-Astronomy	
NAG 8-782	Columbia University	4479	Columbia astrophysics laboratory participation in ginga
<i>Period</i>	<i>Obligations</i>		
06/01/89-05/31/90	FY89: \$50,000	TOTAL: \$50,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Halpern, J.	MSFC/Varcas, J.	99-Multi-Discip	
NAG 9-256	Columbia University	4480	Accelerated heavy ions and microlesions
<i>Period</i>	<i>Obligations</i>		
09/15/87-09/01/90	FY89: \$70,000	TOTAL: \$175,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Worgul, D.	JSC/Nachtwey, D. S.	56-Medical Sciences	
NAG 9-329	Columbia University	4481	Early differentiation of the Moon: Experimental and modeling studies
<i>Period</i>	<i>Obligations</i>		
03/01/89-03/01/90	FY89: \$109,500	TOTAL: \$109,500	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Longhi, J.	JSC/Browne, I. D.	19-Phys Sci, NEC	
NAGW 567	Columbia University	4482	Problems in neutron star physics
<i>Period</i>	<i>Obligations</i>		
03/15/84-03/31/89	FY89: \$8,107	TOTAL: \$177,714	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Shaham, J.	HQ-EZ/Kaluzienski, L. J.	11-Astronomy	
	HQ-EZ/Bunner, A. N.		
NAGW 835	Columbia University	4483	13 c, D and 14 C in methane
<i>Period</i>	<i>Obligations</i>		
10/01/85-03/31/89	FY89:	TOTAL: \$128,041	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Fairbanks, R. G.	HQ-EE/Kurylo, M. J.	39-Env Sci, NEC	
	HQ-EE/Watson, R. T.		
NAGW 860	Columbia University	4484	Decision in complex tasks paths
<i>Period</i>	<i>Obligations</i>		
02/05/86-08/31/90	FY89:	TOTAL: \$382,744	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Galanter, E.	HQ-E/Rosendhal, J. D.	69-Psych, NEC	
	HQ-EP/Konkel, R. M.		

**NASA'S UNIVERSITY PROGRAM
NEW YORK (Continued)**

NAGW 894 Columbia University 4485
Linear and nonlinear studies of Alfvén waves in space
Period Obligations
01/15/86-01/14/90 FY89: TOTAL: \$411,437
Prin. Invest. NASA Tech. Officer CASE Category
Raup, D. M. HQ-ES/Mellott, M. M. 13-Physics
Hasegawa, A. HQ-EE/Eastman, T. E.

NAGW 895 Columbia University 4486
Influence of climate change on deep sea ventilation
Period Obligations
05/15/86-05/14/90 FY89: \$250,000 TOTAL: \$668,355
Prin. Invest. NASA Tech. Officer CASE Category
Broecker, W. S. HQ-EE/Kurylo, M. J. 31-Atmos Sci
Hamelin, B. HQ-EE/Watson, R. T.

NAGW 916 Columbia University 4487
Modeling studies of the effects of winds and heat flux on the tropical ocean
Period Obligations
07/01/86-06/30/89 FY89: TOTAL: \$258,843
Prin. Invest. NASA Tech. Officer CASE Category
Cane, M. A. HQ-EE/Richman, J. G. 33-Oceanography
HQ-EE/Wilson, W. S.

NAGW 1344 Columbia University 4488
Antarctic ocean polynyas
Period Obligations
07/01/88-09/30/89 FY89: TOTAL: \$61,963
Prin. Invest. NASA Tech. Officer CASE Category
Jacobs, S. S. HQ-EE/Thomas, R. H. 33-Oceanography
Gordon, A. L. HQ-EE/Wilson, W. S.

NAGW 1370 Columbia University 4489
Development of a high resolution liquid xenon imaging chamber for gamma ray astronomy
Period Obligations
05/01/88-04/30/90 FY89: \$53,000 TOTAL: \$99,986
Prin. Invest. NASA Tech. Officer CASE Category
Aprile, E. HQ-EZ/Kaluzienski, L. J. 11-Astronomy
HQ-EZ/Bunner, A. N.

NAGW 1579 Columbia University 4490
Effects of simulated microgravity and hypergravity on mammalian development and differentiation
Period Obligations
11/01/88-10/31/89 FY89: \$55,376 TOTAL: \$55,376
Prin. Invest. NASA Tech. Officer CASE Category
Wolgemuth, D. J. HQ-EB/Halstead, T. 59-Life Sci, NEC

NAGW 1610 Columbia University 4491
Stationary and dynamic processes in magnetospheric plasmas: Theory and experiment
Period Obligations
01/15/89-01/14/90 FY89: \$59,535 TOTAL: \$59,535
Prin. Invest. NASA Tech. Officer CASE Category
Bhattacharjee, A. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Perry, T. W.

NAGW 1618 Columbia University 4492
Physics of systems containing neutron stars
Period Obligations
03/01/89-02/28/90 FY89: \$63,943 TOTAL: \$63,943
Prin. Invest. NASA Tech. Officer CASE Category
Shaham, J. HQ-EZ/Kaluzienski, L. J. 11-Astronomy
HQ-EZ/Bunner, A. N.

NAGW 1752 Columbia University 4493
The cosmonaut polynya characteristics dynamics thermodynamics
Period Obligations
04/01/89-01/31/90 FY89: \$57,810 TOTAL: \$57,810
Prin. Invest. NASA Tech. Officer CASE Category
Gordon, A. L. HQ-EE/Thomas, R. H. 33-Oceanography
HQ-EE/Wilson, W. S.

NAS 5-33018 Columbia University 4494
GLRS observations in the Aegean sea for EOS
Period Obligations
08/25/89-12/14/90 FY89: \$8,000 TOTAL: \$8,000
Prin. Invest. NASA Tech. Officer CASE Category
Kastens, K. GSFC/Soffen, G. 39-Env Sci, NEC

NCA 2-294 Columbia University 4495
Turbulence spectrum of a passive temperature field
Period Obligations
03/01/88-10/31/89 FY89: \$6,400 TOTAL: \$31,400
Prin. Invest. NASA Tech. Officer CASE Category
Prendergast, K. ARC/Rubenstein, M. W. 19-Phys Sci, NEC
ARC/Rogallo, R. S.

NCA 2-172102 Columbia University 4496
Biotelemetric analysis of pediatric long-bone reconstruction
Period Obligations
05/15/81-06/30/88 FY89: TOTAL: \$32,000
Prin. Invest. NASA Tech. Officer CASE Category
Pawluk, R. J. ARC/Arnaud, S. B. 56-Medical Sciences
Dick, H. M.

NCC 2-325 Columbia University 4497
Intercellular communication and intracellular metabolic responses by bone cells to simulated weightlessness
Period Obligations
11/01/84-10/31/89 FY89: \$80,000 TOTAL: \$355,443
Prin. Invest. NASA Tech. Officer CASE Category
Doty, S. B. ARC/Holton, E. M. 51-Biological Sci

NCC 5-29 Columbia University 4498
Atmospheric, climatic and environmental research
Period Obligations
10/01/83-11/30/89 FY89: \$544,120 TOTAL: \$2,890,824
Prin. Invest. NASA Tech. Officer CASE Category
Broecker, W. S. GSFC/Travis, L. D. 31-Atmos Sci
Gornitz, V. M.

NCC 5-32 Columbia University 4499
Ground hydrology model suitable for global climate modeling
Period Obligations
07/01/84-05/31/88 FY89: TOTAL: \$103,862
Prin. Invest. NASA Tech. Officer CASE Category
Zobler, L. GSFC/Travis, L. 39-Env Sci, NEC

NCC 5-34 Columbia University 4500
Modeling of ocean circulation and atmospheric chemical systems
Period Obligations
11/15/85-11/30/89 FY89: \$110,000 TOTAL: \$424,000
Prin. Invest. NASA Tech. Officer CASE Category
Chu, C. K. GSFC/Stothers, R. 31-Atmos Sci

**NASA'S UNIVERSITY PROGRAM
NEW YORK (Continued)**

NCC 5-36		Columbia University	4501	NAG 1-954		Cornell University	4509
Global habitability studies				Hypersonic turbulence modeling			
<i>Period</i>		<i>Obligations</i>		<i>Period</i>		<i>Obligations</i>	
01/13/86-10/31/89		FY89: \$244,930	TOTAL: \$936,148	01/24/89-01/23/90		FY89: \$148,716	TOTAL: \$148,716
<i>Prin. Invest.</i>		<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>		<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Levenson, R. L.		GSFC/Travis, L.	31-Atmos Sci	Lumley, J. L.		LARC/Erlebacher, G.	41-Aero Engr
				LARC/Harris, J. E.			
NCC 5-37		Columbia University	4502	NAG 1-1009		Cornell University	4510
Research in astrophysical processes				Real time trajectory optimization on parallel processors			
<i>Period</i>		<i>Obligations</i>		<i>Period</i>		<i>Obligations</i>	
07/01/86-06/30/90		FY89: \$30,302	TOTAL: \$190,046	07/01/89-06/30/90		FY89: \$33,523	TOTAL: \$33,523
<i>Prin. Invest.</i>		<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>		<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Ruderman, M. A.		GSFC/Carlson, B.	11-Astronomy	Psiaki, M. L.		LARC/Queen, E. M.	46-Mech Engr
				LARC/Moerder, D. D.			
NCC 8-6		Columbia University	4503	NAG 2-207		Cornell University	4511
High temperature superconductors				Medium and high resolution infrared spectroscopy from the G.P. Kuiper Airborne Observatory			
<i>Period</i>		<i>Obligations</i>		<i>Period</i>		<i>Obligations</i>	
11/18/88-11/17/89		FY89: \$85,259	TOTAL: \$85,259	11/01/82-10/31/89		FY89: \$101,979	TOTAL: \$1,118,507
<i>Prin. Invest.</i>		<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>		<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Wu, M. K.		MSFC/Curreri, P. A.	13-Physics	Herter, T. L.		ARC/Haughney, L. C.	11-Astronomy
Curreri, P. A.		MSFC/Strauss, E. M.					
NGT 00-050-198		Columbia University	4504	NAG 2-373		Cornell University	4512
NASA graduate student researchers program				Aerodynamics of engine airframe interaction			
<i>Period</i>		<i>Obligations</i>		<i>Period</i>		<i>Obligations</i>	
06/01/87-05/31/90		FY89: \$18,000	TOTAL: \$54,000	10/01/85-10/31/88		FY89:	TOTAL: \$157,679
<i>Prin. Invest.</i>		<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>		<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Martin, C.		HQ-XE/Owens, F. C.	13-Physics	Caughey, D. A.		ARC/Chyu, W. J.	41-Aero Engr
						ARC/Bencze, D. P.	
NGT 00-050-257		Columbia University	4505	NAG 2-524		Cornell University	4513
NASA graduate student researchers program				A heat pipe mechanism for volcanism and tectonics on Venus			
<i>Period</i>		<i>Obligations</i>		<i>Period</i>		<i>Obligations</i>	
01/01/88-12/31/88		FY89:	TOTAL: \$18,000	05/01/88-04/30/90		FY89: \$30,000	TOTAL: \$61,000
<i>Prin. Invest.</i>		<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>		<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Longman, R.		HQ-XE/Owens, F. C.	46-Mech Engr	Turcotte, D. L.		ARC/Lasher, L. E.	11-Astronomy
						ARC/Fimmel, R. O.	
NGT 00-050-315		Columbia University	4506	NAG 2-554		Cornell University	4514
NASA graduate student researchers program				Tilt rotor aircraft aeroacoustics			
<i>Period</i>		<i>Obligations</i>		<i>Period</i>		<i>Obligations</i>	
08/01/88-07/31/90		FY89: \$18,000	TOTAL: \$36,000	01/01/89-12/31/89		FY89: \$74,762	TOTAL: \$74,762
<i>Prin. Invest.</i>		<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>		<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Wolgemuth, D. J.		HQ-XE/Owens, F. C.	12-Chemistry	George, A. R.		HQ-RF/Smith, C. A.	41-Aero Engr
						ARC/Mosher, M.	
NGT 00-070-102		Columbia University	4507	NAG 2-588		Cornell University	4515
NASA graduate student researchers underrepresented minority focus program				Transonic blade-vortex interaction noise: A parametric study			
<i>Period</i>		<i>Obligations</i>		<i>Period</i>		<i>Obligations</i>	
10/01/88-09/30/90		FY89: \$36,000	TOTAL: \$36,000	06/01/89-08/31/89		FY89: \$6,969	TOTAL: \$6,969
<i>Prin. Invest.</i>		<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>		<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Rich, R. M.		HQ-XE/Schwartz, E.	11-Astronomy	Lyrintzis, A.		ARC/Kitaplioglu, C.	41-Aero Engr
						ARC/Betzina, M.	
NSG 7105		Columbia University	4508	NAG 2-593		Cornell University	4516
Calculation of collision cross sections of astrophysical interest				Very large fault-tolerant distributed systems			
<i>Period</i>		<i>Obligations</i>		<i>Period</i>		<i>Obligations</i>	
12/01/74-11/30/89		FY89: \$40,000	TOTAL: \$543,928	06/01/89-11/30/89		FY89: \$342,164	TOTAL: \$342,164
<i>Prin. Invest.</i>		<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>		<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Flynn, G.		HQ-EZ/Gillett, F. C.	11-Astronomy	Birman, K. P.		ARC/Lum, H.	22-Computer Science
		HQ-EZ/Weiler, E. J.				ARC/McKellar, D.	

**NASA'S UNIVERSITY PROGRAM
NEW YORK (Continued)**

NAG 3-349 Cornell University 4517
Stall recovery research
Period Obligations
11/15/82-11/18/90 FY89: \$21,567 TOTAL: \$441,509
Prin. Invest. NASA Tech. Officer CASE Category
Moore, F. K. LERC/Newman, F. A. 41-Aero Engr

NAG 5-779 Cornell University 4525
Vertical crustal motion from satellite geodesy: The terrestrial connection
Period Obligations
05/01/86-03/31/90 FY89: \$58,000 TOTAL: \$213,000
Prin. Invest. NASA Tech. Officer CASE Category
Brown, L. D. GSFC/Frey, H. V. 32-Geological Sci
Oliver, J. E.

NAG 3-645 Cornell University 4518
Multistage calculation of 3-D turbomachinery flows
Period Obligations
06/27/85-01/30/89 FY89: TOTAL: \$142,050
Prin. Invest. NASA Tech. Officer CASE Category
Caughay, D. A. LERC/Chima, R. V. 41-Aero Engr

NAG 5-813 Cornell University 4526
Participation in the Voyager infrared spectroscopy experiment
Period Obligations
10/15/86-12/31/89 FY89: \$58,183 TOTAL: \$161,188
Prin. Invest. NASA Tech. Officer CASE Category
Rosborough, G. W. GSFC/Conrath, B. J. 31-Atmos Sci

NAG 3-801 Cornell University 4519
Influence of hydrodynamics on capillary containment of liquids in a microgravity environment
Period Obligations
06/01/87-09/19/90 FY89: \$60,075 TOTAL: \$230,581
Prin. Invest. NASA Tech. Officer CASE Category
Steen, P. H. LERC/Salzman, J. A. 43-Chem Engr

NAG 5-860 Cornell University 4527
Analysis of regional deformation and strain accumulation data adjacent for the San Andreas Fault
Period Obligations
11/01/86-11/30/89 FY89: TOTAL: \$101,059
Prin. Invest. NASA Tech. Officer CASE Category
Turcotte, D. L. GSFC/Frey, H. V. 32-Geological Sci

NAG 3-803 Cornell University 4520
Propulsion systems utilizing unsteady flows
Period Obligations
07/01/87-08/31/88 FY89: TOTAL: \$64,990
Prin. Invest. NASA Tech. Officer CASE Category
Resler, E. L. LERC/Newman, F. A. 41-Aero Engr

NAG 5-1116 Cornell University 4528
E region rocket radar instability study
Period Obligations
02/01/89-01/31/90 FY89: \$30,362 TOTAL: \$30,362
Prin. Invest. NASA Tech. Officer CASE Category
Swartz, W. E. GSFC/Pfaff, R. F. 19-Phys Sci, NEC
Providakes, J. F.

NAG 3-987 Cornell University 4521
Combustion of free or unsupported fuel droplets
Period Obligations
02/20/89-01/18/90 FY89: \$65,298 TOTAL: \$65,298
Prin. Invest. NASA Tech. Officer CASE Category
Avedisian, C. T. LERC/Haggard, J. B. 46-Mech Engr

NAG 5-1247 Cornell University 4529
A search for millisecond pulsars and their progenitors
Period Obligations
09/01/89-11/30/89 FY89: \$7,400 TOTAL: \$7,400
Prin. Invest. NASA Tech. Officer CASE Category
Cordes, J. M. GSFC/West, D. 11-Astronomy

NAG 3-1063 Cornell University 4522
Parallel processing for nonlinear structural dynamics simulation
Period Obligations
07/15/89-05/15/90 FY89: \$45,000 TOTAL: \$45,000
Prin. Invest. NASA Tech. Officer CASE Category
Abel, J. F. LERC/Lawrence, C. 41-Aero Engr

NAG 5-1248 Cornell University 4530
Far infrared emission in a complete sample of selected galaxies
Period Obligations
09/01/89-11/30/89 FY89: \$6,900 TOTAL: \$6,900
Prin. Invest. NASA Tech. Officer CASE Category
Haynes, M. P. GSFC/West, D. 11-Astronomy

NAG 3-1069 Cornell University 4523
Wave processes applied to aero propulsion
Period Obligations
09/01/89-08/31/90 FY89: \$131,850 TOTAL: \$131,850
Prin. Invest. NASA Tech. Officer CASE Category
Resler, E. L. LERC/Newman, F. A. 41-Aero Engr

NAG 5-1261 Cornell University 4531
Analysis of IRAS solar system dust data TEM
Period Obligations
09/01/89-11/30/89 FY89: \$9,700 TOTAL: \$9,700
Prin. Invest. NASA Tech. Officer CASE Category
Dermott, S. F. GSFC/West, D. 11-Astronomy

NAG 5-601 Cornell University 4524
Interferometric phase velocity measurements of plasma waves in the Earth's ionosphere
Period Obligations
02/01/82-02/28/90 FY89: \$228,543 TOTAL: \$1,102,758
Prin. Invest. NASA Tech. Officer CASE Category
Kintner, P. M. GSFC/Early, L. J. 13-Physics
Kelley, M. C. GSFC/Pless, R. H.

NAGW 3 Cornell University 4532
The amyloplast as a gravity sensing device in plants
Period Obligations
10/01/79-03/31/90 FY89: \$50,000 TOTAL: \$461,170
Prin. Invest. NASA Tech. Officer CASE Category
Leopold, A. C. HQ-EB/Halstead, T. W. 51-Biological Sci

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NAGW 111	Cornell University	4533	NAGW 1006	Cornell University	4541
A study of particle size sorting in Martian wind streaks			Physics of solar coronal heating		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
11/01/80-10/31/89	FY89: \$53,000	TOTAL: \$319,397	02/01/87-01/31/90	FY89: \$30,000	TOTAL: \$200,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Thomas, P. C.	HQ-EL/Underwood, J. R.	32-Geological Sci	Sudan, R. N.	HQ-ES/Ahluwalia, H. S.	13-Physics
	HQ-EL/Boyce, J. M.			HQ-ES/Kane, S.	
NAGW 310	Cornell University	4534	NAGW 1023	Cornell University	4542
Studies of planetary rings			Geologic studies of Mars and outer planets		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
04/01/82-09/30/89	FY89: \$61,500	TOTAL: \$579,831	11/01/86-09/30/90	FY89: \$103,600	TOTAL: \$314,100
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Burns, J. A.	HQ-EL/Underwood, J.	32-Geological Sci	Squyres, S.	HQ-EL/Underwood, J.	32-Geological Sci
	HQ-EL/Boyce, J. M.			HQ-EL/Boyce, J. M.	
NAGW 392	Cornell University	4535	NAGW 1083	Cornell University	4543
Dynamics of co-orbital satellites and asteroids			Influence of volcanism on the tectonics and state of stress on Mars		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
11/01/82-09/30/89	FY89: \$60,000	TOTAL: \$606,388	05/01/87-04/30/90	FY89: \$14,000	TOTAL: \$33,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Dermott, S. F.	HQ-EL/Underwood, J. R.	32-Geological Sci	Turcotte, D. L.	HQ-EL/Underwood, J. R.	32-Geological Sci
	HQ-EL/Boyce, J. M.			HQ-EL/Boyce, J. M.	
NAGW 493	Cornell University	4536	NAGW 1087	Cornell University	4544
Template reactions and chemical evolution			Remote sensing of biogeochemical cycle		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
07/01/83-09/30/89	FY89: \$67,000	TOTAL: \$358,016	05/01/87-06/30/90	FY89: \$17,996	TOTAL: \$94,190
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Usher, D. A.	HQ-EB/Rummel, J.	12-Chemistry	Mills, E. L.	HQ-EE/Wickland, D. E.	39-Env Sci, NEC
	HQ-EB/Averner, M.		Nealson, K. H.	HQ-EE/Ruzek, M. J.	
			Wrigley, R.		
NAGW 544	Cornell University	4537	NAGW 1091	Cornell University	4545
Dynamical studies of Saturn's rings			Collaborative electronic field research with the People's Republic of China		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
03/01/84-09/30/89	FY89: \$24,800	TOTAL: \$169,758	06/01/87-08/31/89	FY89: \$28,000	TOTAL: \$53,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Nicholson, P. D.	HQ-EL/Underwood, J. R.	32-Geological Sci	Kelley, M. C.	HQ-ES/Mellott, M. M.	13-Physics
	HQ-EL/Boyce, J. M.			HQ-ES/Perry, T. W.	
NAGW 666	Cornell University	4538	NAGW 1186	Cornell University	4546
Theoretical physics of accreting, magnetized neutron stars and the resulting X-ray emission			Uranus data analysis program layered convection on the outer planets		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
11/01/84-10/31/89	FY89: \$71,316	TOTAL: \$248,948	09/15/87-09/14/90	FY89: \$83,581	TOTAL: \$83,581
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Salpeter, E. E.	HQ-EZ/Kaluzienski, L. J.	11-Astronomy	Gierasch, P. J.	HQ-EL/Quaide, W. L.	19-Phys Sci, NEC
	HQ-EZ/Bunner, A.			HQ-EL/Fox, K.	
NAGW 757	Cornell University	4539	NAGW 1187	Cornell University	4547
Electrostatic plasma turbulence in the ionosphere			The origin and fate of uranian dust		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
10/01/85-09/30/88	FY89:	TOTAL: \$131,703	09/15/87-09/14/90	FY89: \$40,368	TOTAL: \$58,792
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Seyler, C. E.	HQ-EE/Mellott, M. M.	13-Physics	Burns, J. A.	HQ-EL/Quaide, W. L.	11-Astronomy
	HQ-EE/Parks, G. K.			HQ-EL/Boyce, J. M.	
NAGW 963	Cornell University	4540	NAGW 1199	Cornell University	4548
Experimental determination of melting behavior of Fe and Fe alloys at high pressure: Implications for core compositions of terrestrial planets			Resurfacing and tectonism on the satellites of Uranus		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
07/15/86-08/31/89	FY89:	TOTAL: \$95,574	09/15/87-09/14/90	FY89: \$57,000	TOTAL: \$87,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Bassett, W. A.	HQ-EL/Underwood, J. R.	32-Geological Sci	Squyres, S. W.	HQ-EL/Quaide, W.	19-Phys Sci, NEC
	HQ-EL/Boyce, J. M.		Salpeter, E. E.	HQ-EL/Underwood, J.	

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NAGW 1200 Cornell University 4549
 Uranian rings dynamics and particle size distribution
Period Obligations
 10/01/87-09/30/90 FY89: \$39,698 TOTAL: \$54,698
Prin. Invest. NASA Tech. Officer CASE Category
 Nicholson, P. D. HQ-EL/Quaide, W. L. 19-Phys Sci, NEC
 HQ-EL/Boyce, J. M.

NAGW 1447 Cornell University 4557
 The structure of the asteroid belt
Period Obligations
 09/01/88-08/31/89 FY89: TOTAL: \$18,487
Prin. Invest. NASA Tech. Officer CASE Category
 Darmott, S. F. HQ-EL/Quaide, W. L. 11-Astronomy

NAGW 1201 Cornell University 4550
 Voyager Uranus data analysis shapes of Uranus and its satellites from limb coordinate techniques
Period Obligations
 10/01/87-09/30/90 FY89: \$50,000 TOTAL: \$75,000
Prin. Invest. NASA Tech. Officer CASE Category
 Thomas, P. HQ-EL/Quaide, W. L. 19-Phys Sci, NEC
 HQ-EL/Boyce, J. M.

NAGW 1495 Cornell University 4558
 Cloud morphology photometric classification and zonal velocity studies of the uranian atmosphere by doubling adding image ratio techniques
Period Obligations
 10/01/88-09/30/89 FY89: \$32,000 TOTAL: \$32,000
Prin. Invest. NASA Tech. Officer CASE Category
 Sagan, C. HQ-EL/Quaide, W. L. 19-Phys Sci, NEC

NAGW 1202 Cornell University 4551
 Voyager Uranus data analysis program dynamics of the Uranian satellites
Period Obligations
 09/01/87-08/31/89 FY89: \$44,000 TOTAL: \$85,107
Prin. Invest. NASA Tech. Officer CASE Category
 Dermott, S. F. HQ-EL/Quaide, W. L. 11-Astronomy
 HQ-EL/Boyce, J. M.

NAGW 1533 Cornell University 4559
 Bispectral analysis of wave data
Period Obligations
 01/01/89-06/30/90 FY89: \$37,776 TOTAL: \$37,776
Prin. Invest. NASA Tech. Officer CASE Category
 Steinhardt, A. HQ-ES/Mellott, M. M. 13-Physics
 HQ-ES/Perry, T. W.

NAGW 1221 Cornell University 4552
 Uranus satellites global photometric maps and photometric terrain classification
Period Obligations
 10/01/87-09/30/90 FY89: \$71,626 TOTAL: \$110,336
Prin. Invest. NASA Tech. Officer CASE Category
 Veverka, J. HQ-EL/Quaide, W. L. 32-Geological Sci
 HQ-EL/Underwood, J.

NAGW 1574 Cornell University 4560
 Simulation and theory of magnetosphere ionosphere plasma dynamics
Period Obligations
 03/01/89-02/28/90 FY89: \$55,000 TOTAL: \$55,000
Prin. Invest. NASA Tech. Officer CASE Category
 Seyler, C. E. HQ-ES/Mellott, M. M. 13-Physics
 HQ-ES/Perry, T. W.

NAGW 1262 Cornell University 4553
 Kinetics of nuclear and condensation from vapors of metals and metal oxides
Period Obligations
 04/01/88-03/31/90 FY89: \$50,000 TOTAL: \$100,000
Prin. Invest. NASA Tech. Officer CASE Category
 Bauer, S. H. HQ-EZ/Gillett, F. C. 11-Astronomy

NAGW 1581 Cornell University 4561
 Theoretical and experimental studies of plasma instabilities in the Earth's ionosphere
Period Obligations
 02/01/89-01/31/90 FY89: \$70,000 TOTAL: \$70,000
Prin. Invest. NASA Tech. Officer CASE Category
 Kelley, M. C. HQ-ES/Mellott, M. M. 13-Physics
 HQ-ES/Perry, T. W.

NAGW 1287 Cornell University 4554
 Surface expression of lithosphere dynamics Northern Alaska
Period Obligations
 05/01/88-04/30/90 FY89: \$73,617 TOTAL: \$148,815
Prin. Invest. NASA Tech. Officer CASE Category
 Hoffman, J. T. HQ-EE/Baltuck, M. 32-Geological Sci
 HQ-EE/Ruzek, M. R.

NAS 2-12524 Cornell University 4562
 Space infrared telescope facility phase I
Period Obligations
 02/10/87-10/30/90 FY89: \$1,382,000 TOTAL: \$2,508,000
Prin. Invest. NASA Tech. Officer CASE Category
 Houck, J. ARC/Leidich, C. 11-Astronomy

NAGW 1420 Cornell University 4555
 Implications of convection within the Moon and the terrestrial planet
Period Obligations
 01/01/88-09/30/89 FY89: \$10,500 TOTAL: \$24,500
Prin. Invest. NASA Tech. Officer CASE Category
 Turcotte, D. L. HQ-EL/Underwood, J. R. 32-Geological Sci

NAS 5-28739 Cornell University 4563
 Thematic mapper study of Alaska ophiolites
Period Obligations
 07/26/85-11/26/88 FY89: TOTAL: \$215,281
Prin. Invest. NASA Tech. Officer CASE Category
 Bird, J. M. GSFC/Oseroff, H. 32-Geological Sci

NAGW 1444 Cornell University 4556
 Low-temperature thermodynamics and liquid-vapor equilibria in N2 hydrocarbon systems
Period Obligations
 07/01/88-11/30/89 FY89: \$27,000 TOTAL: \$77,994
Prin. Invest. NASA Tech. Officer CASE Category
 Thompson, W. R. HQ-EL/Fox, K. 11-Astronomy
 HQ-EL/Quaide, W. L.

NAS 5-28767 Cornell University 4564
 Mountain building processes in the central Andes part I
Period Obligations
 08/14/85-06/14/89 FY89: TOTAL: \$406,989
Prin. Invest. NASA Tech. Officer CASE Category
 Bloom, A. L. GSFC/Oseroff, H. 32-Geological Sci
 Isacks, B. L. GSFC/Stuart, L. M.

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NAS 5-30554	Cornell University	4565	EOS interdisciplinary study
<i>Period</i>	<i>Obligations</i>		
09/06/89-12/14/90	FY89: \$45,000	TOTAL: \$45,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Isacks, B. L.	GSFC/Soffen, G.	32-Geological Sci	
NAS 5-33004	Cornell University	4566	Estimation of the land surface water budget
<i>Period</i>	<i>Obligations</i>		
09/08/89-12/14/90	FY89: \$10,000	TOTAL: \$10,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Brutsaert, W. H.	GSFC/Soffen, G.	31-Atmos Sci	
NAS 8-36687	Cornell University	4567	A definition phase of the NASA CRRES mission plan
<i>Period</i>	<i>Obligations</i>		
08/30/85-12/31/89	FY89: \$172,350	TOTAL: \$523,725	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Kelley, M.	MSFC/Stone, J. F.	31-Atmos Sci	
	MSFC/Richards, L.		
NASW 3342	Cornell University	4568	Set up a computer system for the spacecraft planetary imaging facility at Cornell
<i>Period</i>	<i>Obligations</i>		
10/01/79-10/31/89	FY89: \$30,992	TOTAL: \$429,296	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Veverka, J.	HQ-EL/Underwood, J. R.	32-Geological Sci	
	HQ-EL/Quaide, W. L.		
NCA 2-381	Cornell University	4569	Heating of interstellar grains during accretion onto the solar nebula
<i>Period</i>	<i>Obligations</i>		
01/23/89-01/29/90	FY89: \$27,074	TOTAL: \$27,074	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Squyres, S. W.	ARC/Pollack, J. B.	11-Astronomy	
	ARC/McKay, C. P.		
NCA 2-439	Cornell University	4570	Contrast and vertical structure of discrete cloud features on Uranus joint research interchange
<i>Period</i>	<i>Obligations</i>		
08/15/89-08/14/91	FY89: \$10,000	TOTAL: \$10,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Thompson, W. R.	ARC/Stoker, C.	13-Physics	
NGL 33-010-186	Cornell University	4571	Studies of thermal structure and motion of planetary atmospheres
<i>Period</i>	<i>Obligations</i>		
04/18/73-06/14/90	FY89: \$54,315	TOTAL: \$952,015	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Gierasch, P. J.	HQ-EL/Bergstralh, J. T.	31-Atmos Sci	
	HQ-EL/Quaide, W. L.		
NGR 33-010-082	Cornell University	4572	Studies of satellite and planetary atmosphere
<i>Period</i>	<i>Obligations</i>		
01/01/88-10/31/89	FY89: \$54,513	TOTAL: \$113,511	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Sagan, C.	HQ-EL/Bergstralh, J. T.	31-Atmos Sci	
	HQ-EL/Quaide, W.		
NGR 33-010-101	Cornell University	4573	An integrated program in exobiology and problems related to origin of life
<i>Period</i>	<i>Obligations</i>		
10/09/69-09/30/89	FY89: \$150,000	TOTAL: \$2,036,445	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Sagan, C. E.	HQ-EB/Rummel, J. D.	12-Chemistry	
Khare, B. N.	HQ-EB/Averner, M.		
Thompson, W. R.			
NGR 33-010-220	Cornell University	4574	Interdisciplinary investigations of Mariner 9 data
<i>Period</i>	<i>Obligations</i>		
12/05/73-09/30/89	FY89: \$61,300	TOTAL: \$971,501	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Sagan, C. E.	HQ-EL/Underwood, J. R.	32-Geological Sci	
	HQ-EL/Boyce, J. M.		
NGT 00-050-188	Cornell University	4575	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
06/01/87-05/31/90	FY89: \$18,000	TOTAL: \$54,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Burns, J. A.	HQ-XE/Owens, F. C.	13-Physics	
NGT 00-050-197	Cornell University	4576	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
06/01/87-12/31/89	FY89: \$11,100	TOTAL: \$47,100	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Leopold, A. C.	HQ-XE/Owens, F. C.	55-Agriculture Sci	
NGT 00-050-211	Cornell University	4577	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
06/01/87-05/31/90	FY89: \$18,000	TOTAL: \$54,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Bird, J. M.	HQ-XE/Owens, F. C.	19-Phys Sci, NEC	
NGT 00-050-242	Cornell University	4578	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
08/01/87-07/31/89	FY89:	TOTAL: \$36,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Jordan, T.	HQ-XE/Owens, F. C.	32-Geological Sci	
NGT 00-050-264	Cornell University	4579	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
08/01/88-07/31/90	FY89: \$18,000	TOTAL: \$35,500	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Sievers, A. J.	HQ-XE/Owens, F. C.	13-Physics	
NGT 00-050-280	Cornell University	4580	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
08/28/88-08/27/90	FY89: \$18,000	TOTAL: \$35,920	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Salpeter, E. E.	HQ-EZ/Owens, F. C.	11-Astronomy	

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NGT 00-050-294	Cornell University	4581	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
08/01/88-07/31/90	FY89: \$18,000	TOTAL: \$36,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Bird, J. M.	HQ-XE/Owens, F. C.	51-Biological Sci	
NGT 00-050-302	Cornell University	4582	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
08/20/88-08/19/90	FY89: \$18,000	TOTAL: \$35,920	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Sagen, C.	HQ-XE/Owens, F. C.	11-Astronomy	
NGT 00-050-327	Cornell University	4583	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
08/01/88-07/31/90	FY89: \$18,000	TOTAL: \$36,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hopcroft, J. E.	HQ-XE/Owens, F. C.	22-Computer Science	
NGT 00-050-335	Cornell University	4584	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
08/01/88-07/31/90	FY89: \$18,000	TOTAL: \$36,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Brutsaert, W.	HQ-XE/Owens, F. C.	49-Engr, NEC	
NGT 00-050-482	Cornell University	4585	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
08/20/89-08/19/90	FY89: \$18,000	TOTAL: \$18,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Veverka, J.	HQ-XE/Owens, F. C.	19-Phys Sci, NEC	
NGT 00-070-008	Cornell University	4586	Graduate student researchers underrepresented minority focus program
<i>Period</i>	<i>Obligations</i>		
03/01/87-02/28/89	FY89:	TOTAL: \$36,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Kintner, P. M.	HQ-LE/Owens, F. C.	45-Elec Engr	
NGT 00-070-117	Cornell University	4587	Minority graduate program
<i>Period</i>	<i>Obligations</i>		
06/01/89-05/31/90	FY89: \$18,000	TOTAL: \$18,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Kelley, M. C.	HQ-XE/Owens, F. C.	45-Elec Engr	
NGT 00-070-118	Cornell University	4588	Minority graduate program
<i>Period</i>	<i>Obligations</i>		
06/01/89-05/31/90	FY89: \$18,000	TOTAL: \$18,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Kelley, M. C.	HQ-XE/Owens, F. C.	45-Elec Engr	
NGT 33-010-804	Cornell University	4589	NASA graduate student researchers program
<i>Period</i>	<i>Obligations</i>		
08/20/85-08/19/89	FY89:	TOTAL: \$67,920	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Nicholson, P. D.	HQ-LE/Owens, F. C.	11-Astronomy	
NSG 6020	Cornell University	4590	Rocket investigation of neutral atmosphere ionosphere coupling and planetary electrodynamics
<i>Period</i>	<i>Obligations</i>		
03/01/78-10/31/89	FY89: \$222,479	TOTAL: \$2,197,596	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Kelley, M. C.	GSFC/Early, L. J.	19-Phys Sci, NEC	
Farley, D. T.	GSFC/Pless, R. H.		
NSG 7156	Cornell University	4591	Physical studies of planetary surfaces
<i>Period</i>	<i>Obligations</i>		
07/01/75-09/30/89	FY89: \$64,000	TOTAL: \$708,656	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Veverka, J.	HQ-EL/Underwood, J. R.	32-Geological Sci	
	HQ-EL/Holt, H.		
NSG 7606	Cornell University	4592	Effects of photometric geometry on spectral reflectance measurements
<i>Period</i>	<i>Obligations</i>		
05/01/79-09/30/89	FY89: \$48,800	TOTAL: \$594,295	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Veverka, J.	HQ-EL/Underwood, J. R.	32-Geological Sci	
	HQ-EL/Boyce, J. M.		
NAG 9-399	Fordham University	4593	The culture of murine bone marrow and thymus cells in simulated microgravity
<i>Period</i>	<i>Obligations</i>		
09/14/89-09/13/90	FY89: \$15,000	TOTAL: \$15,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Nissim, L. J.	JSC/Goldstein, S. H.	56-Medical Sciences	
NAGW 468	Hofstra University	4594	Radar measurements of ocean surface waves using the aircraft two frequency scatterometer
<i>Period</i>	<i>Obligations</i>		
05/01/83-09/30/89	FY89: \$76,522	TOTAL: \$387,674	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Weissman, D. E.	HQ-EE/Lagerloef, G. S.	33-Oceanography	
	HQ-EE/Wilson, W. S.		
NAGW 735	Hunter College	4595	Center of expertise in spatial modeling and its application to remote sensing
<i>Period</i>	<i>Obligations</i>		
03/01/85-08/31/88	FY89: \$30,500	TOTAL: \$565,889	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Strahler, A. H.	HQ-EE/Goward, S. N.	39-Env Sci, NEC	
	HQ-EE/Ruzek, M.		
NAG 3-892	Manhattan College	4596	Thermal analysis of rocket thrust chambers effects of axial conduction and chambers reaction
<i>Period</i>	<i>Obligations</i>		
05/15/88-08/14/90	FY89: \$67,000	TOTAL: \$117,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Naraghi, M. H.	LERC/Armstrong, E. S.	49-Engr, NEC	
NAG 2-536	Mt Sinai Sch of Med of The Cuny	4597	Velocity storage in microgravity
<i>Period</i>	<i>Obligations</i>		
04/01/88-03/31/89	FY89: \$79,585	TOTAL: \$79,585	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Cohen, B.	ARC/Daunton, N. G.	51-Biological Sci	
Raphan, T.	ARC/Corcoran, M. L.		

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NAG 2-573 Mt Sinai Sch of Med of The Cuny 4598
Effects of microgravity on velocity storage
Period *Obligations*
01/01/89-10/31/89 FY89: \$152,195 TOTAL: \$152,195
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Cohen, B. ARC/Connolly, J. P. 59-Life Sci, NEC
ARC/Ballard, R. W.

NAGW 1701 Mt Sinai Sch of Med of The Cuny 4599
Velocity storage in microgravity
Period *Obligations*
01/01/89-12/31/89 FY89: \$80,000 TOTAL: \$80,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Cohen, B. HQ-EB/Stoklosa, J. H. 56-Medical Sciences

NCA 2-426 New York Medical College 4600
Computer modeling of the vestibulo-oculo-head neck system
Period *Obligations*
07/24/89-09/16/89 FY89: \$10,476 TOTAL: \$10,476
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Pellionisz, A. J. ARC/Tomko, D. L. 51-Biological Sci

NAG 2-493 New York University 4601
Control primitives for high level manipulation
Period *Obligations*
10/01/87-10/31/89 FY89: \$50,000 TOTAL: \$100,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Dommel, J. W. ARC/Meyer, G. 49-Engr, NEC

NAG 3-1048 New York University 4602
Figure of merit study of beam power concepts for advanced space exploration
Period *Obligations*
05/15/89-09/14/89 FY89: \$30,273 TOTAL: \$30,273
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Miller, G. LERC/Christian, J. L. 19-Phys Sci, NEC
LERC/Cataldo, R. L.

NAG 5-73 New York University 4603
Multifrequency observations of selected extragalactic sources
Period *Obligations*
06/01/80-06/30/88 FY89: TOTAL: \$151,200
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Glassgold, A. E. GSFC/Kondo, Y. 11-Astronomy
Bregman, J. N.
Huggins, P. J.

NAG 5-341 New York University 4604
Computational methods for general circulation models numerical methods for data assimilation and initialization
Period *Obligations*
07/01/83-11/14/89 FY89: \$100,000 TOTAL: \$680,500
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Isaacson, E. GSFC/Suarey, M. 31-Atmos Sci
Stoker, J. J.

NAG 5-820 New York University 4605
Data assimilation for general circulation models
Period *Obligations*
07/15/86-02/28/90 FY89: \$45,000 TOTAL: \$265,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Cohn, S. GSFC/Pfaendtner, J. 31-Atmos Sci

NAG 5-1033 New York University 4606
Numerical experiments with a stratospheric tropospheric general circulation model
Period *Obligations*
01/01/88-12/31/88 FY89: TOTAL: \$20,132
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Takano, K. GSFC/Peslen, C. A. 31-Atmos Sci

NAG 5-1238 New York University 4607
Research relative to the physics package for tropospheric analysis/general circulation model
Period *Obligations*
09/01/89-11/30/89 FY89: \$30,000 TOTAL: \$30,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Takamo, K. GSFC/Helfand, M. 31-Atmos Sci

NAGW 630 New York University 4608
Physical properties of molecular clouds
Period *Obligations*
06/01/84-01/31/90 FY89: \$50,000 TOTAL: \$278,499
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Glassgold, A. E. HQ-EZ/Gillett, F. C. 11-Astronomy
HQ-EZ/Weiler, E. J.

NAGW 781 New York University 4609
Solar terrestrial physics research
Period *Obligations*
07/01/85-09/30/89 FY89: \$161,250 TOTAL: \$846,121
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Strauss, H. HQ-ES/Mellott, M. M. 11-Astronomy
HQ-EE/Curtis, S. A.

NAGW 850 New York University 4610
Multi-property modeling in two-dimensions of ocean carbon fluxes
Period *Obligations*
12/01/85-11/30/88 FY89: TOTAL: \$118,922
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Volk, T. HQ-EE/Yoder, J. A. 33-Oceanography
HQ-EE/Wilson, W. S.

NAGW 1697 New York University 4611
Biogeochemical modeling across major mass extinction boundaries the response of the Earth system to severe shocks
Period *Obligations*
01/01/89-12/31/89 FY89: \$29,800 TOTAL: \$29,800
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Rampino, M. R. HQ-EB/Rummel, J. D. 54-Env Biology

NCA 2-101 New York University 4612
The role of reservoir sized for the maintenance of life in closed systems
Period *Obligations*
02/01/86-08/31/88 FY89: TOTAL: \$26,206
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Volk, T. ARC/MacElroy, R. D. 59-Life Sci, NEC
ARC/Toon, O. B.

NCC 1-58 New York University 4613
Analysis of vortex wake structure
Period *Obligations*
11/03/81-06/30/90 FY89: TOTAL: \$287,500
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Ting, L. LARC/Liu, C. H. 41-Aero Engr

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NCC 2-608 New York University 4614
The dynamics of hydroponic crops for simulation studies of the CELSS initial reference configurations
Period Obligations
04/01/89-03/31/90 FY89: \$61,116 TOTAL: \$61,116
Prin. Invest. NASA Tech. Officer CASE Category
Volk, T. ARC/MacElroy, R. D. 51-Biological Sci

NGT 00-050-470 New York University 4615
NASA graduate student researchers program
Period Obligations
07/01/89-08/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Rampino, M. R. HQ-XE/Owens, F. C. 51-Biological Sci

NAG 1-888 Polytechnic Institute of New York 4616
Ultrasonic real-time monitoring of semiconductor growth
Period Obligations
06/01/88-12/31/89 FY89: \$73,920 TOTAL: \$150,221
Prin. Invest. NASA Tech. Officer CASE Category
Schleich, D. M. LARC/Fripp, A. L. 13-Physics
LARC/Heyman, J. S.

NAG 1-986 Polytechnic Institute of New York 4617
Analysis test correlation of large space structures with random parameters
Period Obligations
03/08/89-12/07/89 FY89: \$34,973 TOTAL: \$34,973
Prin. Invest. NASA Tech. Officer CASE Category
Kozin, F. LARC/Housner, J. M. 46-Mech Engr
Klosner, J. M.

NAG 1-1001 Polytechnic Institute of New York 4618
Computer aided reliability availability and safety modeling for Fault tolerant computer systems
Period Obligations
06/01/89-01/15/90 FY89: \$40,349 TOTAL: \$40,349
Prin. Invest. NASA Tech. Officer CASE Category
Shooman, M. L. LARC/Meissner, C. W. 22-Computer Science

NAG 5-1051 Polytechnic Institute of New York 4619
Chamber experiments for simulating the artificial plasma layers produced in the upper atmosphere
Period Obligations
06/15/88-09/14/90 FY89: \$33,000 TOTAL: \$83,007
Prin. Invest. NASA Tech. Officer CASE Category
Kuo, S. P. GSFC/Benson, R. F. 13-Physics

NCC 2-172 Polytechnic Institute of New York 4620
Geometrical acoustics and transonic helicopter sound
Period Obligations
02/01/82-10/31/89 FY89: \$60,125 TOTAL: \$305,420
Prin. Invest. NASA Tech. Officer CASE Category
Isom, M. P. ARC/Gallman, J. M. 41-Aero Engr
ARC/Yu, Y. H.

NGT 00-050-122 Polytechnic Institute of New York 4621
NASA graduate student researchers program
Period Obligations
06/01/87-05/31/88 FY89: TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Mijovic, J. HQ-LE/Owens, F. C. 43-Chem Engr

NAG 1-253 Rensselaer Polytechnic Institute 4622
Mechanical properties studies pertaining to enhanced toughness matrices for high performance composites
Period Obligations
02/01/82-08/31/88 FY89: TOTAL: \$387,104
Prin. Invest. NASA Tech. Officer CASE Category
Sternstein, S. S. LARC/Johnston, N. J. 47-Materials Engr
LARC/Hinkley, J. A.

NAG 1-515 Rensselaer Polytechnic Institute 4623
Spacecraft controller synthesis for the NASA IEEF design challenge
Period Obligations
09/01/84-09/30/89 FY89: TOTAL: \$143,869
Prin. Invest. NASA Tech. Officer CASE Category
Kaufman, H. LARC/Joshi, S. M. 45-Elec Engr
Balas, M. J. LARC/Taylor, L. W.

NAG 1-807 Rensselaer Polytechnic Institute 4624
The vibration characteristics of a metal monocoque helicopter tail cone of moderate size
Period Obligations
09/01/87-08/31/89 FY89: TOTAL: \$45,500
Prin. Invest. NASA Tech. Officer CASE Category
Bielawa, R. LARC/Kvaternik, R. G. 41-Aero Engr

NAG 1-929 Rensselaer Polytechnic Institute 4625
Analytical and numerical modeling of atmospheric propagation using parabolic approximations
Period Obligations
11/15/88-11/14/89 FY89: \$52,579 TOTAL: \$52,579
Prin. Invest. NASA Tech. Officer CASE Category
Jacobson, M. J. LARC/McAninch, G. L. 13-Physics
Siegmann, W. L. LARC/Mueller, A. W.
Robertson, J. S.

NAG 1-980 Rensselaer Polytechnic Institute 4626
The preparation and polymerization of new silicon containing monomers for use in coatings for space structures
Period Obligations
06/01/89-05/31/90 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. NASA Tech. Officer CASE Category
Crivello, J. V. LARC/Connell, J. W. 12-Chemistry
LARC/Hergenrother, P. M.

NAG 1-1018 Rensselaer Polytechnic Institute 4627
Nonlinear dynamic analysis of flexible multibody systems
Period Obligations
06/01/89-05/31/90 FY89: \$59,723 TOTAL: \$59,723
Prin. Invest. NASA Tech. Officer CASE Category
Bauchau, O. A. LARC/Kvaternik, R. G. 41-Aero Engr

NAG 3-333 Rensselaer Polytechnic Institute 4628
Influence of melt convection on solid liquid interfaces under terrestrial and reduced gravity environments
Period Obligations
10/01/82-04/30/89 FY89: TOTAL: \$1,360,380
Prin. Invest. NASA Tech. Officer CASE Category
Glicksman, M. E. LERC/Winsa, E. A. 47-Materials Engr
LERC/Kraft, G. A.

NAG 3-544 Rensselaer Polytechnic Institute 4629
Minority engineering program
Period Obligations
04/01/84-06/29/90 FY89: \$70,000 TOTAL: \$420,000
Prin. Invest. NASA Tech. Officer CASE Category
Burnett, N. LARC/Lawrence, R. F. 49-Engr, NEC

**NASA'S UNIVERSITY PROGRAM
NEW YORK (Continued)**

NAG 3-604	Rensselaer Polytechnic Institute		4630
	Diffused junction induction thiosphite solar cells		
	<i>Period</i>	<i>Obligations</i>	
	02/20/85-02/19/90	FY89: \$65,000	TOTAL: \$380,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Ghandhi, S. K.	LERC/Weinberg, I.	45-Elec Engr
	Borrego, J. M.	LERC/Flood, D.	
NAG 3-744	Rensselaer Polytechnic Institute		4631
	Gravitational effects on liquid phase sintering		
	<i>Period</i>	<i>Obligations</i>	
	10/01/86-09/29/88	FY89:	TOTAL: \$150,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	German, R. M.	LERC/Santoro, G. J.	47-Materials Engr
NAG 3-810	Rensselaer Polytechnic Institute		4632
	Experimental investigation of unsteady flow closure models		
	<i>Period</i>	<i>Obligations</i>	
	07/09/87-01/09/90	FY89: \$30,000	TOTAL: \$85,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Mayle, R. E.	LERC/Adamczyk, J. J.	41-Aero Engr
NAG 3-916	Rensselaer Polytechnic Institute		4633
	Futuristic propulsion systems		
	<i>Period</i>	<i>Obligations</i>	
	06/20/88-06/14/90	FY89: \$125,400	TOTAL: \$155,400
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Myrabo, L. N.	LERC/Luidems, R. W.	41-Aero Engr
NAG 3-978	Rensselaer Polytechnic Institute		4634
	Gravitational effects in liquid phase sintering		
	<i>Period</i>	<i>Obligations</i>	
	02/15/89-02/14/90	FY89: \$111,000	TOTAL: \$111,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	German, R. M.	LERC/Santoro, G. J.	47-Materials Engr
NAG 3-1065	Rensselaer Polytechnic Institute		4635
	Telescience testbed for materials processing		
	<i>Period</i>	<i>Obligations</i>	
	08/01/89-03/31/90	FY89: \$79,914	TOTAL: \$79,914
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Hahn, R. C.	LERC/Johnston, J. C.	47-Materials Engr
		LERC/Glasgow, T. K.	
NAG 5-487	Rensselaer Polytechnic Institute		4636
	Interactive computer graphics		
	<i>Period</i>	<i>Obligations</i>	
	10/15/84-09/30/89	FY89: \$45,019	TOTAL: \$146,770
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Wozny, M. J.	GSFC/Truskowski, W.	49-Engr, NEC
NAG 5-1182	Rensselaer Polytechnic Institute		4637
	A radiation transport code for modeling infrared astronomy satellite (IRAS) sources		
	<i>Period</i>	<i>Obligations</i>	
	08/01/89-01/31/90	FY89: \$18,500	TOTAL: \$18,500
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Leung, C. M.	GSFC/West, D.	11-Astronomy
NAGW 476	Rensselaer Polytechnic Institute		4638
	Investigation of HCN synthesis on Jupiter by photolysis of NH ₃		
	<i>Period</i>	<i>Obligations</i>	
	09/01/83-10/31/89	FY89: \$6,570	TOTAL: \$282,255
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Ferris, J. P.	HQ-EL/Bergstralh, J. T.	11-Astronomy
		HQ-EL/Quaide, W. L.	
NAGW 642	Rensselaer Polytechnic Institute		4639
	Spectral reflectance properties of meteoritic mineral assemblages for the interpretation of asteroid surface materials		
	<i>Period</i>	<i>Obligations</i>	
	07/01/84-09/30/89	FY89: \$37,500	TOTAL: \$358,160
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Gaffey, M. J.	HQ-EL/Underwood, J. R.	32-Geological Sci
		HQ-EL/Boyce, J. M.	
NAGW 1103	Rensselaer Polytechnic Institute		4640
	Radiation transport in dust in disk geometry		
	<i>Period</i>	<i>Obligations</i>	
	06/01/87-11/30/89	FY89: \$51,000	TOTAL: \$101,835
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Leung, C.	HQ-EZ/Gillett, F. C.	11-Astronomy
		HQ-EZ/Stachnik, R. V.	
NAGW 1333	Rensselaer Polytechnic Institute		4641
	NASA center for intelligent robotic systems for space exploration		
	<i>Period</i>	<i>Obligations</i>	
	06/01/88-02/28/90	FY89: \$1,333,333	TOTAL: \$1,833,333
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Saridis, G. N.	HQ-RC/Montemerlo, M. D.	49-Engr, NEC
NAGW 1372	Rensselaer Polytechnic Institute		4642
	Determination of nickel iron metal abundances in MSA type asteroid surfaces materials from IRAS data		
	<i>Period</i>	<i>Obligations</i>	
	09/01/88-02/28/90	FY89:	TOTAL: \$30,329
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Gaffey, M. J.	HQ-EL/Quaide, W. L.	11-Astronomy
NAS 3-25368	Rensselaer Polytechnic Institute		4643
	Isothermal dendritic growth experiment		
	<i>Period</i>	<i>Obligations</i>	
	12/15/88-07/30/93	FY89: \$215,000	TOTAL: \$215,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Glicksman, M. E.	LERC/Winsa, E. A.	47-Materials Engr
		LERC/Kraft, G. A.	
NAS 8-32936	Rensselaer Polytechnic Institute		4644
	Vapor growth of alloy-type semiconductor crystals experiment		
	<i>Period</i>	<i>Obligations</i>	
	03/20/78-10/31/89	FY89: \$125,000	TOTAL: \$1,201,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Wiedemier, H.	MSFC/Schaefer, D. A.	47-Materials Engr
	Davidson, M. C.	MSFC/Williams, J. R.	
	Irene, M.		
NCA 2-319	Rensselaer Polytechnic Institute		4645
	Automated finite element modeling techniques		
	<i>Period</i>	<i>Obligations</i>	
	06/01/88-05/31/90	FY89: \$40,000	TOTAL: \$80,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Shepard, M.	ARC/Woo, A. C.	29-Math/Computer, NEC
	Flaherty, J.	ARC/Enomoto, F.	

**NASA'S UNIVERSITY PROGRAM
NEW YORK (Continued)**

NGL 33-018-003 Rensselaer Polytechnic Institute 4646			
Interdisciplinary materials research fundamental physics and chemistry of materials, environmental effects, and related problems			
<i>Period</i>	<i>Obligations</i>		
05/01/84-04/30/88	FY89:	TOTAL: \$8,902,826	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Loewy, R. G.	HQ/Mulville, D.	41-Aero Engr	
Wiberly, S. E.	HQ/Venneri, S. L.		
Scammell, R. E.			
NGR 33-018-148 Rensselaer Polytechnic Institute 4647			
Photochemical investigations of the atmosphere of other planets			
<i>Period</i>	<i>Obligations</i>		
08/27/70-10/31/89	FY89: \$108,000	TOTAL: \$1,236,350	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Ferris, J. P.	HQ-EB/Rummel, J. D.	12-Chemistry	
	HQ-EB/Averner, M.		
NGT 00-050-418 Rensselaer Polytechnic Institute 4648			
NASA graduate student researchers program			
<i>Period</i>	<i>Obligations</i>		
07/01/89-07/31/90	FY89: \$18,000	TOTAL: \$18,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Lauderbaugh, L. K.	HQ-XE/Owens, F. C.	46-Mech Engr	
NGT 00-050-430 Rensselaer Polytechnic Institute 4649			
NASA graduate student researchers program			
<i>Period</i>	<i>Obligations</i>		
07/01/89-06/30/90	FY89: \$18,000	TOTAL: \$18,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Schowalter, L. J.	HQ-XE/Owens, F. C.	13-Physics	
NGT 00-050-505 Rensselaer Polytechnic Institute 4650			
NASA graduate student researchers program			
<i>Period</i>	<i>Obligations</i>		
06/01/89-05/31/90	FY89: \$18,000	TOTAL: \$18,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Lauderbaugh, L. K.	HQ-XE/Owens, F. C.	46-Mech Engr	
NGT 00-070-104 Rensselaer Polytechnic Institute 4651			
Graduate student researchers underrepresented minority focus program			
<i>Period</i>	<i>Obligations</i>		
09/01/88-08/31/89	FY89: \$18,000	TOTAL: \$18,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Myrabo, L. N.	HQ-XE/Owens, F. C.	49-Engr, NEC	
NAGW 888 Rochester Institute of Technology 4652			
Investigation of southern ocean mesoscale variability from Seasat altimetry			
<i>Period</i>	<i>Obligations</i>		
04/01/86-09/30/89	FY89:	TOTAL: \$123,880	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Sciremammano, F.	HQ-EE/Richman, J. G.	33-Oceanography	
	HQ-EE/Wilson, W. S.		
NAG 1-583 State Univ of New York - Albany 4653			
Measurement of heat and moisture fluxes at the top of the rain forest during Amazon boundary layer experiment (ABLE)			
<i>Period</i>	<i>Obligations</i>		
04/16/85-12/31/87	FY89:	TOTAL: \$46,434	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Fitzjarrald, D. R.	LARC/Ritter, J. A.	31-Atmos Sci	
	LARC/Harriss, R. C.		
NAG 1-692 State Univ of New York - Albany 4654			
Measurement of the Amazon forest canopy interaction with the atmosphere			
<i>Period</i>	<i>Obligations</i>		
07/11/86-07/10/89	FY89:	TOTAL: \$90,948	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Fitzjarrald, D. R.	LARC/Ritter, J. A.	31-Atmos Sci	
	LARC/Harriss, R. C.		
NAG 1-847 State Univ of New York - Albany 4655			
Observations of surface layer control of arctic trace gas emissions			
<i>Period</i>	<i>Obligations</i>		
02/01/88-01/31/90	FY89: \$86,895	TOTAL: \$183,118	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Fitzjarrald, D. R.	LARC/Ritter, J. A.	31-Atmos Sci	
	LARC/Harriss, R. C.		
NAG 2-277 State Univ of New York - Albany 4656			
Use of radon and cosmogenic radionuclides as indicators of exchange between the troposphere and stratosphere			
<i>Period</i>	<i>Obligations</i>		
01/01/84-04/30/89	FY89: \$21,439	TOTAL: \$416,064	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Kritz, M. A.	ARC/Wilhelmi, A. J.	31-Atmos Sci	
	ARC/Russell, P. B.		
NAG 2-495 State Univ of New York - Albany 4657			
Search for molecular absorptions with the Fourier transform spectrometer			
<i>Period</i>	<i>Obligations</i>		
01/01/88-12/31/89	FY89: \$21,000	TOTAL: \$79,680	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Knacke, R.	ARC/Haughney, L. C.	11-Astronomy	
NAG 2-523 State Univ of New York - Albany 4658			
The chemistry of the nightside of the ionosphere of Venus			
<i>Period</i>	<i>Obligations</i>		
07/01/88-06/30/90	FY89: \$39,999	TOTAL: \$79,952	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Fox, J. L.	ARC/Lasher, L. E.	11-Astronomy	
	ARC/Fimmel, R. O.		
NAG 8-628 State Univ of New York - Albany 4659			
Observations of thunderstorms from U2 airplane			
<i>Period</i>	<i>Obligations</i>		
05/04/87-05/03/88	FY89:	TOTAL: \$15,800	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Vonnegut, B.	MSFC/Blakeslee, R. J.	31-Atmos Sci	
NAG 8-737 State Univ of New York - Albany 4660			
Positive lightning currents to ground			
<i>Period</i>	<i>Obligations</i>		
08/01/88-07/31/89	FY89:	TOTAL: \$19,883	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Orville, R. E.	MSFC/Blakeslee, R. J.	31-Atmos Sci	
NAG 9-78 State Univ of New York - Albany 4661			
Chemistries of lunar and terrestrial glasses			
<i>Period</i>	<i>Obligations</i>		
02/01/84-02/01/90	FY89: \$43,281	TOTAL: \$203,655	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Delano, J. W.	JSC/Browne, I. D.	32-Geological Sci	
Lindsley, D. H.			

NASA'S UNIVERSITY PROGRAM **NEW YORK (Continued)**

NAG 9-82 State Univ of New York - Albany 4662
Petrologic investigations of ureilite meteorites
Period Obligations
03/01/84-03/01/90 FY89: \$17,509 TOTAL: \$93,739
Prin. Invest. NASA Tech. Officer CASE Category
Berkley, J. L. JSC/Browne, I. D. 32-Geological Sci

NAG 9-85 State Univ of New York - Albany 4663
The Kolar Schist belt a possible Archean suture zone
Period Obligations
03/01/84-06/01/90 FY89: \$30,000 TOTAL: \$164,000
Prin. Invest. NASA Tech. Officer CASE Category
Hanson, G. N. JSC/Browne, I. D. 32-Geological Sci

NAS 1-18155 State Univ of New York - Albany 4664
Science team support for Earth radiation budget experiment (ERBE)
Period Obligations
01/10/86-01/10/91 FY89: \$73,100 TOTAL: \$355,100
Prin. Invest. NASA Tech. Officer CASE Category
Cess, R. D. LARC/Cooper, J. L. 31-Atmos Sci

NAS 5-30126 State Univ of New York - Albany 4665
CPMS scientific data interpretation
Period Obligations
10/21/87-09/30/94 FY89: TOTAL: \$25,000
Prin. Invest. NASA Tech. Officer CASE Category
Owen, T. GSFC/Niemann, H. 31-Atmos Sci

NAS 8-33380 State Univ of New York - Albany 4666
Remote observations of severe storms
Period Obligations
04/30/79-08/31/89 FY89: TOTAL: \$818,778
Prin. Invest. NASA Tech. Officer CASE Category
Orville, R. E. MSFC/Christian, H. J. 31-Atmos Sci
MSFC/Smith, G. T.

NAS 9-16604 State Univ of New York - Albany 4667
Establish microbial control in air/water post-treatment beds
Period Obligations
04/01/82-05/01/89 FY89: TOTAL: \$95,500
Prin. Invest. NASA Tech. Officer CASE Category
Janauer, G. E. JSC/Sauer, R. 54-Env Biology

NCA 2-167 State Univ of New York - Albany 4668
Combined use of radon measurements and objective trajectory analysis to recognize long range transport events
Period Obligations
10/01/86-06/30/89 FY89: TOTAL: \$39,655
Prin. Invest. NASA Tech. Officer CASE Category
Kritz, M. A. ARC/Pfister, L. 31-Atmos Sci

NCC 1-102 State Univ of New York - Albany 4669
Nucleation properties of Space Shuttle exhaust particles
Period Obligations
03/01/86-08/31/89 FY89: TOTAL: \$24,314
Prin. Invest. NASA Tech. Officer CASE Category
Lala, G. G. LARC/Cofer, W. R., III 31-Atmos Sci

NCC 1-135 State Univ of New York - Albany 4670
Cooperative study of the arctic boundary layer
Period Obligations
02/01/89-01/31/90 FY89: \$20,000 TOTAL: \$20,000
Prin. Invest. NASA Tech. Officer CASE Category
Fitzjarrald, D. R. LARC/Ritter, J. A. 31-Atmos Sci

NCC 2-311 State Univ of New York - Albany 4671
Chemistry of the outer planets
Period Obligations
07/01/84-12/14/89 FY89: \$57,000 TOTAL: \$292,570
Prin. Invest. NASA Tech. Officer CASE Category
Scattergood, T. W. ARC/Chang, S. 12-Chemistry
Owen, T.

NCC 2-395 State Univ of New York - Albany 4672
Development of a high altitude gas sampler and aerosol collector for a Titan probe gas chromatograph
Period Obligations
12/15/85-12/14/89 FY89: \$26,130 TOTAL: \$85,025
Prin. Invest. NASA Tech. Officer CASE Category
Scattergood, T. W. ARC/Carle, G. C. 59-Life Sci, NEC

NCC 2-502 State Univ of New York - Albany 4673
Use of radon and cosmogenic radionuclides as indicators of exchange between the troposphere and stratosphere
Period Obligations
10/01/87-12/31/89 FY89: \$35,000 TOTAL: \$108,798
Prin. Invest. NASA Tech. Officer CASE Category
Kritz, M. A. ARC/Wegener, S. 31-Atmos Sci
ARC/Russell, P. B.

NCC 2-530 State Univ of New York - Albany 4674
Use of airborne radon measurements to recognize long range transport events in the mid and lower troposphere
Period Obligations
02/01/88-05/31/89 FY89: \$6,000 TOTAL: \$43,000
Prin. Invest. NASA Tech. Officer CASE Category
Kritz, M. A. ARC/Danielsen, E. F. 31-Atmos Sci
ARC/Wegener, S. S.

NGT 33-183-805 State Univ of New York - Albany 4675
NASA graduate student researchers program
Period Obligations
06/01/85-08/31/89 FY89: TOTAL: \$72,000
Prin. Invest. NASA Tech. Officer CASE Category
Rae, W. J. HQ-LE/Owens, F. C. 46-Mech Engr

NAG 1-978 State Univ of New York - Binghamton 4676
Acoustic fatigue life prediction for nonlinear structures with multiple resonant modes
Period Obligations
04/01/89-03/31/90 FY89: \$50,421 TOTAL: \$50,421
Prin. Invest. NASA Tech. Officer CASE Category
Miles, R. N. LARC/Powell, C. A. 46-Mech Engr

NAG 5-145 State Univ of New York - Binghamton 4677
Effects of the oceans on polar motion
Period Obligations
03/01/81-10/31/89 FY89: TOTAL: \$319,960
Prin. Invest. NASA Tech. Officer CASE Category
Dickman, S. R. GSFC/Welker, J. E. 32-Geological Sci

NAG 9-307 State Univ of New York - Binghamton 4678
Methods for sterilization of space station water reuse loop
Period Obligations
08/01/88-08/01/90 FY89: \$65,831 TOTAL: \$65,831
Prin. Invest. NASA Tech. Officer CASE Category
Janauer, G. E. JSC/Sauer, R. L. 51-Biological Sci
JSC/Pierson, D. L.

**NASA'S UNIVERSITY PROGRAM
NEW YORK (Continued)**

NGT 00-050-036 State Univ of New York - Binghamton 4679
NASA graduate student researchers program

Period	Obligations	
06/01/87-05/31/89	FY89:	TOTAL: \$54,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Pattee, H.	HQ-XE/Owens, F.	79-Soc Sci, NEC

NAG 1-950 State Univ of New York - Buffalo 4687
Linear and nonlinear system identification for space structures

Period	Obligations	
02/01/89-04/30/90	FY89: \$85,000	TOTAL: \$85,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Mook, D. J.	LARC/Juang, J. N.	29-Math/Computer, NEC
	LARC/Horta, L. G.	

NGT 00-050-226 State Univ of New York - Binghamton 4680
NASA graduate student researchers program

Period	Obligations	
06/01/87-05/31/90	FY89: \$18,000	TOTAL: \$54,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Janauer, G. E.	HQ-XE/Owens, F. C.	12-Chemistry

NAG 1-993 State Univ of New York - Buffalo 4688
Sensor actuator modeling

Period	Obligations	
05/01/89-04/30/90	FY89: \$19,371	TOTAL: \$19,371
Prin. Invest.	NASA Tech. Officer	CASE Category
Inman, D. J.	LARC/Nimmo, N. A.	45-Elec Engr

NGT 00-050-411 State Univ of New York - Binghamton 4681
NASA graduate student researchers program

Period	Obligations	
08/15/89-08/14/90	FY89: \$18,000	TOTAL: \$18,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Payne, D. G.	HQ-XE/Owens, F. C.	69-Psych, NEC

NAG 3-862 State Univ of New York - Buffalo 4689
Statistical fracture analysis of composite materials

Period	Obligations	
01/10/88-01/09/90	FY89: \$69,428	TOTAL: \$131,191
Prin. Invest.	NASA Tech. Officer	CASE Category
Wetherhold, R. C.	LERC/Gross, B.	47-Materials Engr

NGT 33-188-804 State Univ of New York - Binghamton 4682
NASA graduate student researchers program

Period	Obligations	
01/01/85-12/31/88	FY89:	TOTAL: \$44,991
Prin. Invest.	NASA Tech. Officer	CASE Category
Dickman, S. R.	HQ-LB/Owens, F. C.	32-Geological Sci

NAG 3-863 State Univ of New York - Buffalo 4690
Synthesis of high performance silicon carbides fibers by chemical vapor deposition

Period	Obligations	
01/10/88-01/09/90	FY89: \$130,000	TOTAL: \$213,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Hlavacek, V.	LERC/Dicarlo, J. A.	43-Chem Engr
Revankar, V.	LERC/Levine, S. R.	

NGT 33-188-805 State Univ of New York - Binghamton 4683
NASA graduate student researchers program

Period	Obligations	
06/01/85-05/31/88	FY89:	TOTAL: \$52,611
Prin. Invest.	NASA Tech. Officer	CASE Category
Goel, N. S.	HQ-LE/Owens, F. C.	11-Astronomy

NAG 3-897 State Univ of New York - Buffalo 4691
Synthesis of high performance ceramic fibers titanium diboride titanium carbide boron carbide by chemical vapor deposition for advanced metallics reinforcing

Period	Obligations	
04/07/88-04/06/90	FY89: \$97,500	TOTAL: \$184,318
Prin. Invest.	NASA Tech. Officer	CASE Category
Hlavacek, V.	LERC/Petrasek, D. W.	43-Chem Engr
Revankar, V.		

NAG 1-249 State Univ of New York - Buffalo 4684
Debugging tools and multiport nodes for a distributed environment

Period	Obligations	
01/19/82-01/15/90	FY89: \$50,000	TOTAL: \$504,765
Prin. Invest.	NASA Tech. Officer	CASE Category
Wittie, L. D.	LARC/Murray, N. D.	22-Computer Science
	LARC/Will, R. W.	

NAG 3-962 State Univ of New York - Buffalo 4692
Closure formulation for the average passage equation system for multistage turbomachinery

Period	Obligations	
12/01/88-11/30/89	FY89: \$20,292	TOTAL: \$20,292
Prin. Invest.	NASA Tech. Officer	CASE Category
Taulbee, D. B.	LERC/Adamczyk, J. J.	41-Aero Engr

NAG 1-577 State Univ of New York - Buffalo 4685
Absorptance, emittance, transmittance and interface effects in multilayered films

Period	Obligations	
04/05/85-06/04/88	FY89:	TOTAL: \$100,378
Prin. Invest.	NASA Tech. Officer	CASE Category
Rustgi, M. L.	LARC/Long, S. T.	13-Physics
	LARC/Slemp, W. S.	

NAG 3-1011 State Univ of New York - Buffalo 4693
Time accurate simulations of compressible shear flows

Period	Obligations	
03/01/89-02/28/90	FY89: \$20,000	TOTAL: \$20,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Givi, P.	LERC/Claus, R. W.	41-Aero Engr

NAG 1-785 State Univ of New York - Buffalo 4686
Active suspension systems

Period	Obligations	
06/17/87-10/16/89	FY89: \$10,923	TOTAL: \$17,141
Prin. Invest.	NASA Tech. Officer	CASE Category
Inman, D. J.	LARC/Horner, G. C.	41-Aero Engr

NAG 3-1019 State Univ of New York - Buffalo 4694
Electrical insulation for high temperature space environment

Period	Obligations	
02/07/89-02/06/90	FY89: \$39,000	TOTAL: \$39,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Laghari, J. R.	LERC/Myers, I.	45-Elec Engr
	LERC/Domitz, S.	

**NASA'S UNIVERSITY PROGRAM
NEW YORK (Continued)**

NAGW 966 State Univ of New York - Buffalo 4695
Participation in the hypersonic training and research program

Period	Obligations	
06/01/86-05/31/90	FY89: \$400,000	TOTAL: \$815,000
Prin. Invest.	NASA Tech. Officer	CASE Category
George, W.	HQ-RF/Wander, S. M.	13-Physics
Rae, W. J.	HQ-RF/Graves, R. A.	
Holden, M. S.		

NAS 9-16042 State Univ of New York - Buffalo 4696
Life science flight experiment: Inflight study of cardiovascular deconditioning definition phase

Period	Obligations	
01/17/80-12/01/90	FY89: \$250,000	TOTAL: \$1,806,020
Prin. Invest.	NASA Tech. Officer	CASE Category
Farhi, L.	JSC/Lafferty, P.	59-Life Sci, NEC

NGR 33-015-108 State Univ of New York - Buffalo 4697
Planetary curriculum and related geologic research

Period	Obligations	
06/02/70-09/30/89	FY89: \$46,000	TOTAL: \$970,548
Prin. Invest.	NASA Tech. Officer	CASE Category
King, J. S.	HQ-EL/Scott, D. H.	32-Geological Sci
	HQ-EL/Underwood, J. R.	

NGT 00-050-085 State Univ of New York - Buffalo 4698
NASA graduate student researchers program

Period	Obligations	
06/01/86-11/30/89	FY89:	TOTAL: \$54,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Liu, C. S.	HQ-LE/Owens, F. C.	46-Mech Engr

NGT 00-050-202 State Univ of New York - Buffalo 4699
NASA graduate student researchers program

Period	Obligations	
06/01/87-05/31/88	FY89:	TOTAL: \$18,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Farhi, L. E.	HQ-XE/Owens, F. C.	56-Medical Sciences

NGT 00-070-030 State Univ of New York - Buffalo 4700
Graduate student researchers underrepresented minority focus program

Period	Obligations	
07/01/89-06/30/90	FY89: \$18,000	TOTAL: \$54,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Inman, D. J.	HQ-XE/Owens, F. C.	41-Aero Engr

NGT 00-070-031 State Univ of New York - Buffalo 4701
Graduate student researchers underrepresented minority focus program

Period	Obligations	
08/24/87-08/23/90	FY89: \$18,000	TOTAL: \$54,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Mook, D. J.	HQ-XE/Owens, F. C.	41-Aero Engr

NGT 33-183-802 State Univ of New York - Buffalo 4702
NASA graduate student researchers program

Period	Obligations	
08/30/84-10/12/88	FY89:	TOTAL: \$68,940
Prin. Invest.	NASA Tech. Officer	CASE Category
Inman, D. J.	HQ-LB/Owens, F. C.	46-Mech Engr

NAG 2-329 State Univ of New York - Stony Brook 4703
Studies of the aurorally induced ultraviolet emissions on the nightside of Venus

Period	Obligations	
01/01/85-08/31/88	FY89:	TOTAL: \$91,853
Prin. Invest.	NASA Tech. Officer	CASE Category
Fox, J. L.	ARC/Fimmel, R. O.	13-Physics

NAG 3-651 State Univ of New York - Stony Brook 4704
Expert system for organic synthesis discovery

Period	Obligations	
08/10/85-08/17/88	FY89:	TOTAL: \$180,638
Prin. Invest.	NASA Tech. Officer	CASE Category
Gelernter, H. L.	LERC/Sutter, J. K.	12-Chemistry
	LERC/Serafini, T. T.	

NAG 3-963 State Univ of New York - Stony Brook 4705
Advanced fiber optic for laser light scattering

Period	Obligations	
01/01/89-12/31/89	FY89: \$34,671	TOTAL: \$34,671
Prin. Invest.	NASA Tech. Officer	CASE Category
Dhadwal, H. S.	LERC/Glasgow, T. K.	47-Materials Engr

NAG 5-1083 State Univ of New York - Stony Brook 4706
High resolution observations of Uranus and Neptune Jovian auroral monitoring

Period	Obligations	
09/15/88-09/14/90	FY89: \$47,000	TOTAL: \$70,500
Prin. Invest.	NASA Tech. Officer	CASE Category
Wagener, R.	GSFC/West, D.	11-Astronomy

NAG 5-1206 State Univ of New York - Stony Brook 4707
The three-dimensional nature of atmospheric dynamics and transport variations in stratospheric structure and composition

Period	Obligations	
08/01/89-07/31/90	FY89: \$65,051	TOTAL: \$65,051
Prin. Invest.	NASA Tech. Officer	CASE Category
Geller, M. A.	GSFC/Rood, R. B.	31-Atmos Sci
	GSFC/Kaye, J. A.	

NAG 5-1228 State Univ of New York - Stony Brook 4708
The structure of the nearby universe traced by the infrared astronomical satellite (IRAS) galaxies

Period	Obligations	
09/01/89-12/31/89	FY89: \$8,100	TOTAL: \$8,100
Prin. Invest.	NASA Tech. Officer	CASE Category
Yahil, A.	GSFC/West, D.	11-Astronomy

NAG 5-1231 State Univ of New York - Stony Brook 4709
Far infrared emission from the interstellar molecular clouds near zeta ophiuchi

Period	Obligations	
09/01/89-12/31/89	FY89: \$7,500	TOTAL: \$7,500
Prin. Invest.	NASA Tech. Officer	CASE Category
Solomon, P. M.	GSFC/West, D.	11-Astronomy

NAG 5-1279 State Univ of New York - Stony Brook 4710
The protoplanetary disks of the naked T Tauri stars-ADP

Period	Obligations	
10/01/89-09/30/90	FY89: \$20,000	TOTAL: \$20,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Walter, F. M.	GSFC/West, D. K.	11-Astronomy

**NASA'S UNIVERSITY PROGRAM
NEW YORK (Continued)**

NAG 5-1280 State Univ of New York - Stony Brook 4711
Fourth epoch doppler-imaging observations of AR lacertae-iue
Period Obligations
10/01/89-09/30/90 FY89: \$8,800 TOTAL: \$8,800
Prin. Invest. NASA Tech. Officer CASE Category
Walter, F. M. GSFC/West, D. 11-Astronomy

NAGW 353 State Univ of New York - Stony Brook 4712
Measurement of concentration and variation in stratospheric chlorine oxide from a portable ground based millimeter wave system
Period Obligations
05/15/82-11/15/89 FY89: \$179,239 TOTAL: \$1,346,898
Prin. Invest. NASA Tech. Officer CASE Category
De Zafra, R. HQ-EE/Kurylo, M. J. 31-Atmos Sci
Solomon, P. M. HQ-EB/Watson, R. T.

NAGW 665 State Univ of New York - Stony Brook 4713
Studies of the chemistry of vibrationally and electronically excited species in planetary upper atmospheres
Period Obligations
11/01/84-10/31/89 FY89: \$16,340 TOTAL: \$119,021
Prin. Invest. NASA Tech. Officer CASE Category
Fox, J. L. HQ-EL/Bergstralh, J. T. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NAGW 725 State Univ of New York - Stony Brook 4714
Laboratory investigations on volatile trapping in comets
Period Obligations
03/01/85-05/31/89 FY89: \$30,000 TOTAL: \$225,000
Prin. Invest. NASA Tech. Officer CASE Category
Owens, T. HQ-EB/Rummel, J. D. 12-Chemistry
Bar-nun, A. HQ-EB/Averner, M.

NAGW 876 State Univ of New York - Stony Brook 4715
Interdisciplinary studies of outer planets atmospheres
Period Obligations
02/15/86-08/31/88 FY89: TOTAL: \$80,000
Prin. Invest. NASA Tech. Officer CASE Category
Caldwell, J. J. HQ-EL/Fox, K. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NAGW 1107 State Univ of New York - Stony Brook 4716
Dynamical problems in the solar
Period Obligations
06/01/87-10/31/89 FY89: \$40,000 TOTAL: \$69,000
Prin. Invest. NASA Tech. Officer CASE Category
Lissauer, J. HQ-EL/Underwood, J. R. 32-Geological Sci
HQ-EL/Boyce, J. M.

NAGW 1238 State Univ of New York - Stony Brook 4717
Laboratory spectroscopic measurements relevant to upper atmospheric research
Period Obligations
01/01/88-12/31/89 FY89: \$59,679 TOTAL: \$129,278
Prin. Invest. NASA Tech. Officer CASE Category
Varanasi, P. HQ-EE/Kurylo, M. J. 39-Env Sci, NEC
HQ-EE/Watson, R. T.

NAGW 1481 State Univ of New York - Stony Brook 4718
Infrared spectroscopy of Jupiter and Saturn
Period Obligations
01/01/89-12/31/89 FY89: \$28,758 TOTAL: \$28,758
Prin. Invest. NASA Tech. Officer CASE Category
Knacke, R. HQ-EL/Rahe, J. H. 11-Astronomy

NAGW 1529 State Univ of New York - Stony Brook 4719
Cells embryos and development in space
Period Obligations
11/01/88-10/31/89 FY89: \$70,000 TOTAL: \$70,000
Prin. Invest. NASA Tech. Officer CASE Category
Krikorian, A. D. HQ-EB/Halstead, T. 59-Life Sci, NEC

NAGW 1543 State Univ of New York - Stony Brook 4720
Spectroscopic observations of the planets
Period Obligations
02/01/89-01/31/90 FY89: \$120,062 TOTAL: \$120,062
Prin. Invest. NASA Tech. Officer CASE Category
Owen, T. HQ-EL/Rahe, J. H. 11-Astronomy

NAGW 1560 State Univ of New York - Stony Brook 4721
Testing and operation of a millimeter wave c10 receiver for the network for the detection of stratospheric change
Period Obligations
03/15/89-12/15/89 FY89: \$118,546 TOTAL: \$118,546
Prin. Invest. NASA Tech. Officer CASE Category
Solomon, P. M. HQ-EE/Kurylo, M. J. 31-Atmos Sci
HQ-EE/Watson, R. T.

NAS 8-32904 State Univ of New York - Stony Brook 4722
Scientific investigations in support of the space telescope project
Period Obligations
02/01/78-01/12/90 FY89: \$51,500 TOTAL: \$424,169
Prin. Invest. NASA Tech. Officer CASE Category
Caldwell, J. J. MSFC/Taylor, W. E. 11-Astronomy

NASW 4472 State Univ of New York - Stony Brook 4723
Artificial intelligence to simulate the green thumb factor for plant biotechnologies in space
Period Obligations
09/28/89-03/27/90 FY89: \$34,376 TOTAL: \$34,376
Prin. Invest. NASA Tech. Officer CASE Category
Krikorian, A. D. HQ-Z/Bekey, I. 31-Atmos Sci
Levine, H. G. HQ-Z/Posey, G.

NAS10-11395 State Univ of New York - Stony Brook 4724
Chromosomes and plant cell division in space
Period Obligations
05/12/87-11/23/89 FY89: \$153,989 TOTAL: \$411,461
Prin. Invest. NASA Tech. Officer CASE Category
Krikorian, A. D. KSC/Knott, W. M. 51-Biological Sci

NGR 33-015-139 State Univ of New York - Stony Brook 4725
Quantitative spectroscopic measurements on the principal constituents in planetary atmospheres
Period Obligations
04/12/71-10/31/89 FY89: \$73,237 TOTAL: \$797,388
Prin. Invest. NASA Tech. Officer CASE Category
Varanasi, P. HQ-EL/Bergstralh, J. T. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NGR 33-015-141 State Univ of New York - Stony Brook 4726
Spectroscopic observations of the planets
Period Obligations
01/26/71-07/31/89 FY89: TOTAL: \$728,315
Prin. Invest. NASA Tech. Officer CASE Category
Owen, T. C. HQ-EL/Brinton, H. C. 11-Astronomy
HQ-EL/Rahe, J. H.

NASA'S UNIVERSITY PROGRAM **NEW YORK (Continued)**

NGT 33-015-803 State Univ of New York - Stony Brook 4727
NASA graduate student researchers program
Period *Obligations*
06/01/85-05/31/88 FY89: TOTAL: \$51,099
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Knacke, R. HQ-LE/Owens, F. C. 11-Astronomy

NGT 33-183-804 State Univ of New York - Stony Brook 4728
NASA graduate student researchers program
Period *Obligations*
07/01/85-12/31/89 FY89: \$12,000 TOTAL: \$84,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Inman, D. J. HQ-LE/Owens, F. C. 41-Aero Engr

NSG 7270 State Univ of New York - Stony Brook 4729
Cells, embryos and development in space
Period *Obligations*
09/01/76-10/31/89 FY89: TOTAL: \$874,065
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Krikorian, A. D. HQ-EB/Halstead, T. W. 51-Biological Sci
Steward, F. C.

NSG 7286 State Univ of New York - Stony Brook 4730
Infrared spectroscopy of Jupiter and Saturn
Period *Obligations*
09/01/76-03/31/89 FY89: TOTAL: \$281,782
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Knacke, R. F. HQ-EL/Brinton, H. C. 11-Astronomy
HQ-EL/Rahe, J.

NSG 7553 State Univ of New York - Stony Brook 4731
Outer solar system nomenclature
Period *Obligations*
04/01/79-12/31/89 FY89: \$14,000 TOTAL: \$73,052
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Owens, T. HQ-EL/Underwood, J. R. 32-Geological Sci
HQ-EL/French, B. M.

NAG 2-531 St. U. Ny Hsc-Brooklyn 4732
Mechanism and control of disuse atrophy in skeletal muscle
Period *Obligations*
02/01/88-07/31/89 FY89: TOTAL: \$69,540
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Ettinger, J. D. ARC/Grindeland, R. E. 56-Medical Sciences
ARC/Arnaud, S. B.

NAG 9-257 State Univ of New York Col - Plattsburgh 4733
Connection with trace elemental abundance measurements on cosmic dust particles
Period *Obligations*
10/01/87-12/01/88 FY89: TOTAL: \$12,892
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Flynn, G. J. JSC/Goldstein, S. H. 19-Phys Sci, NEC

NSG 5077 State Univ of New York College - Purchase 4734
Spectral and Monte Carlo predictability studies
Period *Obligations*
09/01/75-04/30/90 FY89: \$43,950 TOTAL: \$367,545
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Tenenbaum, J. GSFC/Helfand, M. 31-Atmos Sci
Reddi, M.

NAG 1-759 Syracuse University 4735
Comprehensive analysis of helicopters with bearingless rotors
Period *Obligations*
07/01/87-06/30/90 FY89: TOTAL: \$115,507
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Murthy, V. R. LARC/Yeager, W. T. 41-Aero Engr

NAG 1-806 Syracuse University 4736
An experimental and analytical study of ultra high reliable software
Period *Obligations*
08/01/87-09/30/90 FY89: \$37,291 TOTAL: \$106,938
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Goel, A. L. LARC/Finelli, G. B. 22-Computer Science

NAG 2-306 Syracuse University 4737
Linear and nonlinear dynamic analysis of redundant load path bearingless rotor systems
Period *Obligations*
07/01/84-09/30/89 FY89: TOTAL: \$192,052
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Murthy, V. R. ARC/Peterson, R. 41-Aero Engr
ARC/Warmbrodt, W.

NAG 3-621 Syracuse University 4738
Unsteady transonic heat transfer in a transient facility
Period *Obligations*
02/28/85-05/31/90 FY89: \$22,081 TOTAL: \$197,107
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Legraff, J. E. LERC/O'Brien, J. E. 46-Mech Engr
LERC/Simoneau, R. J.

NAG 3-837 Syracuse University 4739
Mechanism of mode II shear crack growth in a single crystal
Period *Obligations*
11/10/87-02/08/90 FY89: \$84,991 TOTAL: \$171,161
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Liu, H. W. LERC/Telesman, J. 46-Mech Engr

NAG 3-1051 Syracuse University 4740
Analysis and prediction of unsteady turbine blade heat study
Period *Obligations*
07/01/89-06/30/90 FY89: \$25,000 TOTAL: \$25,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bogucz, E. A. LERC/O'Brien, J. E. 41-Aero Engr

NCA 2-232 Syracuse University 4741
The perception of 3 dimensional motion by man and machine
Period *Obligations*
06/15/87-11/01/88 FY89: TOTAL: \$10,772
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Pelli, D. G. ARC/Watson, A. B. 69-Psych, NEC
ARC/Ahumada, A. J.

NCA 2-390 Syracuse University 4742
Attention allocation in visual information processing
Period *Obligations*
02/01/89-08/31/89 FY89: \$19,800 TOTAL: \$19,800
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Folk, C. L. ARC/Remington, R. W. 69-Psych, NEC

**NASA'S UNIVERSITY PROGRAM
NEW YORK (Continued)**

NAG 5-938 Union College 4743

The formation and processing of interstellar dust

<i>Period</i>	<i>Obligations</i>	
07/01/87-08/31/90	FY89: \$35,870	TOTAL: \$42,290
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Peak, D.	GSFC/Donn, B. D.	13-Physics
	GSFC/Nuth, J.	

NAG 2-117 University of Rochester 4744

Development of an infrared CCD for use in astronomy

<i>Period</i>	<i>Obligations</i>	
06/01/81-09/30/89	FY89: \$25,000	TOTAL: \$514,764
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Forrest, W. J.	ARC/Goebel, J. H.	11-Astronomy
Pipher, J. L.	ARC/McCreight, C. R.	
Galema, S. D.		

NAG 2-539 University of Rochester 4745

Submillimeter spectroscopy with an SIS heterodyne receiver

<i>Period</i>	<i>Obligations</i>	
10/01/88-09/30/89	FY89: \$72,999	TOTAL: \$108,099
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Wengler, M. J.	ARC/Haughney, L. C.	11-Astronomy

NAG 5-934 University of Rochester 4746

Oscillations in sunspots

<i>Period</i>	<i>Obligations</i>	
07/01/87-06/30/90	FY89: \$34,000	TOTAL: \$96,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Thomas, J. H.	GSFC/Bullock, G. D.	19-Phys Sci, NEC
	GSFC/Gurman, J. B.	

NAGW 1476 University of Rochester 4747

Brown dwarf theory

<i>Period</i>	<i>Obligations</i>	
11/01/88-10/31/89	FY89: \$24,000	TOTAL: \$24,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Van Horn, H. M.	HQ-EZ/Gillett, F. C.	13-Physics

NCC 3-107 University of Rochester 4748

Electrooptic network analyzer

<i>Period</i>	<i>Obligations</i>	
01/15/88-01/14/89	FY89:	TOTAL: \$70,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Dykaar, D.	LERC/Bhasin, K. B.	45-Elec Engr
Jackson, T.		
Mourou, G.		

NSG 7562 University of Rochester 4749

Basic research in sunspot dynamics

<i>Period</i>	<i>Obligations</i>	
10/01/78-10/31/89	FY89: \$38,700	TOTAL: \$318,624
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Thomas, J. H.	HQ-EZ/Ahluwalia, H. S.	13-Physics
	HQ-ES/Kane, J.	

NAG 3-842 Utica College 4750

Phase separation kinetics by light scattering in simulated microgravity effect of molecular weight geometry and solvent

<i>Period</i>	<i>Obligations</i>	
11/30/87-11/29/88	FY89:	TOTAL: \$34,935
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Cerny, L. C.	LERC/Sutter, J. K.	12-Chemistry
	LERC/Roberts, G. D.	

NORTH CAROLINA

NAG 1-70 Duke University 4751

Design of the hybrid automated reliability predictor

<i>Period</i>	<i>Obligations</i>	
06/01/80-08/31/90	FY89: \$52,707	TOTAL: \$640,881
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Trivedi, K. S.	LARC/Bavuso, S. J.	29-Math/Computer, NEC
Geist, R. M.	LARC/Pitts, F. L.	

NAG 1-466 Duke University 4752

Parallel algorithms and architectures for computational structural mechanics

<i>Period</i>	<i>Obligations</i>	
04/01/84-12/30/89	FY89:	TOTAL: \$265,760
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Patrick, M. L.	LARC/Storaasli, O. O.	22-Computer Science
	LARC/Bostic, S. W.	

NAG 1-709 Duke University 4753

Asymptotic modal analysis and statistical energy analysis

<i>Period</i>	<i>Obligations</i>	
10/15/86-10/14/89	FY89: \$60,251	TOTAL: \$180,170
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Dowell, E. A.	LARC/Shepherd, K. P.	46-Mech Engr
	LARC/Powell, C. A.	

NAG 1-722 Duke University 4754

Interior noise reduction by alternate resonance tuning

<i>Period</i>	<i>Obligations</i>	
01/01/87-12/31/89	FY89: \$60,025	TOTAL: \$170,517
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Bliss, D. B.	LARC/Shepherd, K. P.	46-Mech Engr
	LARC/Powell, C. A.	

NAG 3-724 Duke University 4755

Unsteady separated flow models for stall flutter analysis in turbomachinery

<i>Period</i>	<i>Obligations</i>	
05/01/86-04/28/90	FY89: \$59,925	TOTAL: \$239,646
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Dowell, E. H.	LERC/Stefko, G. L.	41-Aero Engr
Bliss, D. P.	LERC/Kiraly, L. J.	

NAG 3-968 Duke University 4756

Vibration control in turbomachinery using active magnetic journal bearings

<i>Period</i>	<i>Obligations</i>	
01/01/89-12/31/89	FY89: \$59,817	TOTAL: \$59,817
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Knight, J. D.	LERC/Brown, G. V.	46-Mech Engr

NAG 5-379 Duke University 4757

Critical transport phenomena in fluid helium under low gravity

<i>Period</i>	<i>Obligations</i>	
11/15/83-03/31/90	FY89: \$71,056	TOTAL: \$560,277
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Meyer, H.	GSFC/Castles, S. H.	13-Physics
Behringer, R. P.	GSFC/Ryschkewitsch, M. G.	

NASA'S UNIVERSITY PROGRAM **NORTH CAROLINA (Continued)**

NAG 9-134 Duke University 4758
Nitrogen elimination and response to decompression: A study of modifying factors
Period Obligations
03/10/86-03/01/90 FY89: \$113,000 TOTAL: \$379,430
Prin. Invest. NASA Tech. Officer CASE Category
Vann, R. D. JSC/Horrigan, D. J. 56-Medical Sciences

NAGW 1259 Duke University 4759
Millimeter and submillimeter laboratory studies of interstellar molecules
Period Obligations
02/01/88-01/31/90 FY89: \$52,534 TOTAL: \$101,516
Prin. Invest. NASA Tech. Officer CASE Category
Herbst, E. HQ-EZ/Gillett, F. C. 11-Astronomy

NAGW 1339 Duke University 4760
Estimation of aboveground tree biomass in old field loblolly pine forests utilizing multifrequency multipolarization airborne SAR data
Period Obligations
07/01/88-12/31/89 FY89: \$33,500 TOTAL: \$55,072
Prin. Invest. NASA Tech. Officer CASE Category
Christensen, N. L. HQ-EE/Wickland, D. E. 39-Env Sci, NEC
Kasischke, E. S. HQ-EE/Pieper, T.
Dobson, M. C.

NAGW 1673 Duke University 4761
Millimeter and submillimeter spectroscopy of molecules of atmospheric importance
Period Obligations
03/01/89-02/28/90 FY89: \$100,387 TOTAL: \$100,387
Prin. Invest. NASA Tech. Officer CASE Category
Delucia, F. C. HQ-EE/Kurylo, M. J. 31-Atmos Sci
HQ-EE/Watson, R. T.

NGT 00-050-046 Duke University 4762
NASA graduate student researchers program
Period Obligations
09/01/86-08/31/89 FY89: TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
De Lucia, F. C. HQ-LE/Owens, F. C. 19-Phys Sci, NEC

NGT 00-050-169 Duke University 4763
NASA graduate student researchers program
Period Obligations
06/01/87-05/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Bliss, D. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 00-050-342 Duke University 4764
NASA graduate student researchers program
Period Obligations
08/23/88-08/22/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Dowell, E. H. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 00-050-366 Duke University 4765
NASA graduate student researchers program
Period Obligations
08/01/88-08/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Richardson, D. HQ-XE/Owens, F. C. 12-Chemistry
Richardson, J. R.

NGT 00-050-459 Duke University 4766
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Cocks, F. H. HQ-XE/Owens, F. C. 46-Mech Engr

NSG 3160 Duke University 4767
Acceleration of convergence
Period Obligations
06/01/77-05/29/90 FY89: \$26,630 TOTAL: \$214,665
Prin. Invest. NASA Tech. Officer CASE Category
Smith, D. A. LERC/Ford, W. F. 21-Mathematics

NSG 7540 Duke University 4768
Millimeter and submillimeter spectroscopy of molecules of atmospheric importance
Period Obligations
03/01/79-08/31/89 FY89: TOTAL: \$715,583
Prin. Invest. NASA Tech. Officer CASE Category
Delucia, F. C. HQ-EE/Kurylo, M. J. 31-Atmos Sci
HQ-EE/Margitan, J. J.

NAG 2-365 East Carolina University 4769
Microgravitational effects on chromosome behavior
Period Obligations
07/01/85-10/31/89 FY89: \$98,500 TOTAL: \$294,437
Prin. Invest. NASA Tech. Officer CASE Category
Bruschi, C. V. ARC/Winget, C. M. 51-Biological Sci
ARC/Ballard, R. W.

NAG 1-405 North Carolina A&T State University 4770
Dynamics and control of orbiting grid structures and the synchronously deployable beam
Period Obligations
10/01/83-09/30/88 FY89: TOTAL: \$423,773
Prin. Invest. NASA Tech. Officer CASE Category
Abu-saba, E. LARC/Montgomery, R. C. 42-Astro Engr
LARC/Taylor, L. W.

NAG 1-763 North Carolina A&T State University 4771
An expert system for planning and scheduling in telerobotic environments
Period Obligations
05/18/87-03/31/90 FY89: \$79,244 TOTAL: \$248,275
Prin. Invest. NASA Tech. Officer CASE Category
Ntuen, C. A. LARC/Goode, P. W. 22-Computer Science
Park, E. H. LARC/Will, R. W.

NAG 1-812 North Carolina A&T State University 4772
Gortler vortices by compact schemes
Period Obligations
09/01/87-10/31/89 FY89: \$99,873 TOTAL: \$194,171
Prin. Invest. NASA Tech. Officer CASE Category
Klimkowski, J. Z. LARC/Gatski, T. B. 41-Aero Engr
Rose, M. E.

NAG 1-815 North Carolina A&T State University 4773
Effect of stimulated brillouin backscattering on high resolution mir fiber optic laser heterodyne spectroscopic systems
Period Obligations
09/01/87-11/15/89 FY89: TOTAL: \$59,990
Prin. Invest. NASA Tech. Officer CASE Category
Yu, C. LARC/Hoell, J. M. 13-Physics

NASA'S UNIVERSITY PROGRAM
NORTH CAROLINA (Continued)

NAG 1-870 North Carolina A&T State University 4774
 Two dimensional object identification techniques
Period Obligations
 04/01/88-06/30/89 FY89: TOTAL: \$124,998
Prin. Invest. NASA Tech. Officer CASE Category
 Lebby, G. LARC/Juang, J. N. 42-Astro Engr
 Sherrod, E. E. LARC/Belvin, W. K.

NAG 1-892 North Carolina A&T State University 4775
 Intact recovery of ballistic range test models
Period Obligations
 07/01/88-09/30/89 FY89: TOTAL: \$75,000
Prin. Invest. NASA Tech. Officer CASE Category
 Sharpe, L. LARC/Witcofski, R. D. 46-Mech Engr
 LARC/Scallion, W. I.

NAG 1-956 North Carolina A&T State University 4776
 A space technology development and utilization program
Period Obligations
 02/01/89-08/31/90 FY89: \$1,049,544 TOTAL: \$1,049,544
Prin. Invest. NASA Tech. Officer CASE Category
 Ram, B. LARC/Massenberg, S. E. 99-Multi-Discip
 LARC/Prior, E. J.

NAG 1-997 North Carolina A&T State University 4777
 Dynamic analysis of the joint dominated beam
Period Obligations
 05/15/89-12/31/89 FY89: \$75,000 TOTAL: \$75,000
Prin. Invest. NASA Tech. Officer CASE Category
 Abu-saba, E. G. LARC/Montgomery, R. C. 42-Astro Engr
 McGinley, W. M. LARC/Williams, J. P.

NAG 3-739 North Carolina A&T State University 4778
 Catalytic decomposition of hydrogen peroxide by transition metal microcyclic amine complexes
Period Obligations
 08/10/86-03/07/90 FY89: \$52,908 TOTAL: \$158,724
Prin. Invest. NASA Tech. Officer CASE Category
 Williamson, A. N. LERC/Mapp, M. W. 12-Chemistry
 LERC/Fielder, W. L.

NAG 3-976 North Carolina A&T State University 4779
 Material studies for solar cell structures
Period Obligations
 02/15/89-02/14/90 FY89: \$125,000 TOTAL: \$125,000
Prin. Invest. NASA Tech. Officer CASE Category
 Colly, W. LERC/Weinberg, I. 45-Elec Engr
 A-fadr, A. LERC/Flood, D. J.
 Shanti, I.

NAG 9-334 North Carolina A&T State University 4780
 VLSI design of Fault tolerant technology for digital signal processing system
Period Obligations
 01/03/89-01/02/90 FY89: \$94,820 TOTAL: \$94,820
Prin. Invest. NASA Tech. Officer CASE Category
 Foster, J. JSC/Herman, C. 19-Phys Sci, NEC

NCA 2-384 North Carolina A&T State University 4781
 Economic design policies for eva suit systems orbital replaceable units
Period Obligations
 01/15/89-01/14/90 FY89: \$39,931 TOTAL: \$39,931
Prin. Invest. NASA Tech. Officer CASE Category
 Ntuen, C. A. ARC/Bretoi, R. N. 49-Engr, NEC
 Park, E. H.

NCA 2-545201 North Carolina A&T State University 4782
 North Carolina A and T student Space Shuttle program/design phase
Period Obligations
 06/01/82-03/31/90 FY89: \$61,061 TOTAL: \$365,955
Prin. Invest. NASA Tech. Officer CASE Category
 Ahrens, S. T. ARC/Schmidt, G. K. 51-Biological Sci

NAG 1-244 North Carolina State Univ. - Raleigh 4783
 Numerical solutions of the complete Navier-Stokes equations
Period Obligations
 01/01/82-08/31/90 FY89: \$37,500 TOTAL: \$549,246
Prin. Invest. NASA Tech. Officer CASE Category
 Hassan, H. A. LARC/Harris, J. E. 41-Aero Engr
 Gantt, E. LARC/Rudy, D. H.
 Walters, R. W.

NAG 1-667 North Carolina State Univ. - Raleigh 4784
 Experiments in Fault tolerant software reliability
Period Obligations
 04/07/86-06/30/89 FY89: TOTAL: \$186,970
Prin. Invest. NASA Tech. Officer CASE Category
 McAllister, D. F. LARC/Eckhardt, D. E., Jr. 22-Computer Science
 Tai, K. C.
 Vouk, M. A.

NAG 1-696 North Carolina State Univ. - Raleigh 4785
 Engineering specification and system design for computer aided design computer aided manufacture CAD CAM of custom shoes
Period Obligations
 08/15/86-12/31/89 FY89: \$221,362 TOTAL: \$601,464
Prin. Invest. NASA Tech. Officer CASE Category
 McAllister, D. F. LARC/Farmer, F. A. 49-Engr, NEC
 Luo, R. C. LARC/Samos, J.

NAG 1-723 North Carolina State Univ. - Raleigh 4786
 The crystallization and crystalline properties of polymers
Period Obligations
 01/01/87-09/30/88 FY89: TOTAL: \$38,546
Prin. Invest. NASA Tech. Officer CASE Category
 Theil, M. H. LARC/Wakelyn, N. T. 47-Materials Engr
 LARC/Johnston, N. J.

NAG 1-738 North Carolina State Univ. - Raleigh 4787
 Focal region fields of distorted reflectors
Period Obligations
 01/06/87-07/05/88 FY89: TOTAL: \$82,147
Prin. Invest. NASA Tech. Officer CASE Category
 Kauffman, J. F. LARC/Bailey, M. C. 45-Elec Engr
 LARC/Staton, L. D.

NAG 1-792 North Carolina State Univ. - Raleigh 4788
 Continued development of the space transportation model simulation on a microcomputer
Period Obligations
 07/01/87-12/31/88 FY89: TOTAL: \$10,331
Prin. Invest. NASA Tech. Officer CASE Category
 Bengtson, N. M. LARC/Morris, W. D. 22-Computer Science

NAG 1-883 North Carolina State Univ. - Raleigh 4789
 Engineering specifications and system design for CAD/CAM of custom shoes data representation
Period Obligations
 05/11/88-06/30/90 FY89: \$68,129 TOTAL: \$134,563
Prin. Invest. NASA Tech. Officer CASE Category
 Rasdorf, W. J. LARC/Farmer, F. H. 22-Computer Science
 LARC/Samos, J.

**NASA'S UNIVERSITY PROGRAM
NORTH CAROLINA (Continued)**

NAG 1-917 North Carolina State Univ. - Raleigh 4790
Shear buckling of specially orthotropic plates with centrally located cutouts
Period *Obligations*
10/17/88-12/31/89 FY89: \$33,859 TOTAL: \$33,859
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Klang, E. C. LARC/Nemeth, M. P. 41-Aero Engr

NAG 1-943 North Carolina State Univ. - Raleigh 4791
Low loss components for switched beam radiometers
Period *Obligations*
01/15/89-03/14/90 FY89: \$119,093 TOTAL: \$119,093
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Trew, R. J. LARC/Hearn, C. P. 45-Elec Engr
Kauffman, J. K.

NAG 1-977 North Carolina State Univ. - Raleigh 4792
NASA NCSU spacecraft controls
Period *Obligations*
03/01/89-02/28/90 FY89: \$61,191 TOTAL: \$61,191
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Silverberg, L. LARC/Montgomery, R. C. 42-Astro Engr
LARC/Welch, S. S.

NAG 1-983 North Carolina State Univ. - Raleigh 4793
Multiversion software reliability through Fault avoidance and Fault tolerance
Period *Obligations*
03/01/89-06/30/90 FY89: \$105,170 TOTAL: \$105,170
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Vouk, M. A. LARC/Eckhardt, D. E. 22-Computer Science
McAllister, D. F.

NAG 3-649 North Carolina State Univ. - Raleigh 4794
Cyclic voltammetry in a porous electrode
Period *Obligations*
07/28/85-12/30/89 FY89: TOTAL: \$85,636
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Fedkiw, P. S. LERC/Hagedorn, N. 43-Chem Engr
LERC/O'Donnell, P.

NAG 3-782 North Carolina State Univ. - Raleigh 4795
Silicon carbide semiconductor device fabrication and characterization
Period *Obligations*
02/10/87-02/07/90 FY89: \$50,000 TOTAL: \$150,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Davis, R. F. LERC/Matus, L. G. 45-Elec Engr
Das, K. K.

NAG 3-855 North Carolina State Univ. - Raleigh 4796
Aerodynamic and acoustic interaction of counter rotating propellers
Period *Obligations*
01/20/88-01/19/90 FY89: \$71,760 TOTAL: \$144,709
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Nagel, R. T. LERC/Krejsa, E. A. 41-Aero Engr
LERC/Groeneweg, J. F.

NAG 5-1042 North Carolina State Univ. - Raleigh 4797
Particle injection and acceleration in parallel and oblique collisionless shocks
Period *Obligations*
03/15/88-04/30/90 FY89: \$34,993 TOTAL: \$64,789
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Ellison, D. C. GSFC/Jones, F. C. 13-Physics

NAG 5-1131 North Carolina State Univ. - Raleigh 4798
Acceleration of positions in supernova shocks
Period *Obligations*
04/15/89-04/14/90 FY89: \$11,001 TOTAL: \$11,001
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Ellison, D. C. GSFC/Jones, F. C. 13-Physics

NAG 8-475 North Carolina State Univ. - Raleigh 4799
The structure of nickel and iron aluminides prepared by rapid solidification and undercooling
Period *Obligations*
08/01/84-07/17/89 FY89: \$14,114 TOTAL: \$285,937
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Koch, C. C. MSFC/Ethridge, E. 47-Materials Engr

NAG 8-731 North Carolina State Univ. - Raleigh 4800
Remnant of SN 1006 AD at X ray infrared and radio wavelengths
Period *Obligations*
08/01/88-07/31/90 FY89: \$15,069 TOTAL: \$28,021
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Reynolds, S. P. MSFC/Harrisik, D. M. 11-Astronomy

NAGW 838 North Carolina State Univ. - Raleigh 4801
Seasonal variations of biogenic methane: Biogeochemical controls
Period *Obligations*
10/01/85-06/30/89 FY89: \$29,300 TOTAL: \$402,803
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Blair, N. E. HQ-EE/Kurylo, M. J. 39-Env Sci, NEC
HQ-EE/Watson, R. T.

NAGW 1072 North Carolina State Univ. - Raleigh 4802
Hypersonic aerodynamics
Period *Obligations*
04/15/87-06/30/90 FY89: \$200,000 TOTAL: \$600,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Dejarnette, R. HQ-RF/Wander, S. M. 19-Phys Sci, NEC
Hart, F. D. HQ-RF/Graves, R. A.

NAGW 1331 North Carolina State Univ. - Raleigh 4803
NSCU and NC A and T university space engineering research center
Period *Obligations*
06/01/88-02/28/90 FY89: \$1,962,518 TOTAL: \$2,462,518
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Dejarnette, F. R. HQ-RF/Wander, S. M. 49-Engr, NEC

NAS 5-30698 North Carolina State Univ. - Raleigh 4804
Monitoring crustal motions in the southwest pacific region using GLRF
Period *Obligations*
06/20/89-12/14/90 FY89: \$15,000 TOTAL: \$15,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Cohen, S. GSFC/Soffen, G. 32-Geological Sci

NAS 8-38135 North Carolina State Univ. - Raleigh 4805
An investigation of the detection of tornadic thunderstorms by observing stormtop features using geosynchronous satellite imagery
Period *Obligations*
09/22/89-09/22/90 FY89: \$49,729 TOTAL: \$49,729
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Anderson, D. E. MSFC/Jedlorek, G. 31-Atmos Sci

**NASA'S UNIVERSITY PROGRAM
NORTH CAROLINA (Continued)**

NCA 2-247 North Carolina State Univ. - Raleigh 4806
Ecosystem productivity and canopy nutrient content in lowland tropical forests

Period	Obligations	
08/01/87-02/15/89	FY89:	TOTAL: \$8,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Hitchner, L. E.	ARC/Peterson, D. L.	54-Env Biology

NCA 2-416 North Carolina State Univ. - Raleigh 4807
Laboratory experimentation on gas dynamic processes related to Mars missions joint research interchange

Period	Obligations	
06/01/89-08/31/89	FY89: \$4,950	TOTAL: \$4,950
Prin. Invest.	NASA Tech. Officer	CASE Category
Dejarnette, F. R.	ARC/Strawa, A. W.	41-Aero Engr
Griffith, W. C.		

NCA 2-417 North Carolina State Univ. - Raleigh 4808
Numerical simulations on gas dynamic processes related to Mars missions joint research interchange

Period	Obligations	
06/01/89-08/15/89	FY89: \$2,365	TOTAL: \$2,365
Prin. Invest.	NASA Tech. Officer	CASE Category
Dejarnette, F. R.	ARC/Green, M. J.	41-Aero Engr
McRae, D. S.		

NCC 1-22 North Carolina State Univ. - Raleigh 4809
Computational fluid mechanics

Period	Obligations	
06/15/79-09/14/91	FY89: \$100,000	TOTAL: \$1,329,152
Prin. Invest.	NASA Tech. Officer	CASE Category
Hassan, H. A.	LARC/Salas, M. D.	41-Aero Engr
Dejarnette, F. R.	LARC/Keller, J. D.	

NCC 1-46 North Carolina State Univ. - Raleigh 4810
Investigation of the aerodynamic characteristics of vortex flows

Period	Obligations	
09/18/80-05/15/90	FY89: \$59,895	TOTAL: \$372,472
Prin. Invest.	NASA Tech. Officer	CASE Category
Dejarnette, F. R.	LARC/Schoonover, W. E., Jr.	41-Aero Engr
	LARC/Hall, R. M.	

NCC 1-98 North Carolina State Univ. - Raleigh 4811
Investigation of the effects of surface roughness on the flow over models in cryogenic wind tunnels

Period	Obligations	
05/15/85-12/31/89	FY89: \$51,597	TOTAL: \$173,965
Prin. Invest.	NASA Tech. Officer	CASE Category
Dejarnette, F. R.	LARC/Gloss, B. B.	41-Aero Engr

NCC 1-100 North Carolina State Univ. - Raleigh 4812
Approximate numerical methods for calculating nonequilibrium viscous flow fields and aerodynamic heating over three dimensional bodies

Period	Obligations	
07/15/85-11/30/89	FY89: \$66,394	TOTAL: \$295,218
Prin. Invest.	NASA Tech. Officer	CASE Category
Dejarnette, F. R.	LARC/Zoby, E. V.	41-Aero Engr

NCC 1-109 North Carolina State Univ. - Raleigh 4813
Hypersonic nozzle design

Period	Obligations	
10/01/86-12/31/89	FY89: \$18,729	TOTAL: \$78,529
Prin. Invest.	NASA Tech. Officer	CASE Category
Griffith, W. C.	LARC/Miller, C. G.	41-Aero Engr
	LARC/Smith, F. M.	

NCC 1-112 North Carolina State Univ. - Raleigh 4814
The transitional flow regime using the Monte Carlo methods

Period	Obligations	
03/15/87-03/14/90	FY89: \$50,000	TOTAL: \$225,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Hassan, H. A.	LARC/Sutton, K.	41-Aero Engr
	LARC/Moss, J. N.	

NCC 1-116 North Carolina State Univ. - Raleigh 4815
Decentralized closed loop maneuver

Period	Obligations	
06/01/87-02/15/89	FY89:	TOTAL: \$78,091
Prin. Invest.	NASA Tech. Officer	CASE Category
Silverberg, L.	LARC/Sparks, D. W.	42-Astro Engr
	LARC/Montgomery, R. C.	

NCC 1-117 North Carolina State Univ. - Raleigh 4816
An analytical inner layer and finite difference outer region method for solving Navier-Stokes equations

Period	Obligations	
05/15/87-10/31/90	FY89: \$44,556	TOTAL: \$123,968
Prin. Invest.	NASA Tech. Officer	CASE Category
Dejarnette, F. R.	LARC/Rudy, D. H.	41-Aero Engr
	LARC/Barnwell, R. W.	

NCC 1-118 North Carolina State Univ. - Raleigh 4817
The flight qualities of the questair configuration

Period	Obligations	
05/16/87-06/30/88	FY89:	TOTAL: \$15,555
Prin. Invest.	NASA Tech. Officer	CASE Category
Perkins, J. N.	LARC/Jordan, F. L.	41-Aero Engr
Vess, R. J.	LARC/Yip, L. P.	

NCC 1-123 North Carolina State Univ. - Raleigh 4818
Assist in study of integrated propulsion and airframe effects of advanced turboprop aircraft

Period	Obligations	
06/01/88-06/30/90	FY89: \$25,141	TOTAL: \$49,529
Prin. Invest.	NASA Tech. Officer	CASE Category
Perkins, J. N.	LARC/Johnson, J. L.	41-Aero Engr
	LARC/Coe, P.	

NCC 1-129 North Carolina State Univ. - Raleigh 4819
Exploratory studies of generic hypersonic nozzle afterbody configurations

Period	Obligations	
10/01/88-05/31/90	FY89: \$45,000	TOTAL: \$45,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Perkins, J. N.	LARC/Erickson, W. D.	41-Aero Engr
Kniskern, M.	LARC/Pittman, J. L.	

NCC 2-101 North Carolina State Univ. - Raleigh 4820
Plant growth in controlled environments in response to characteristics of nutrient solutions

Period	Obligations	
01/01/81-02/28/90	FY89: \$78,479	TOTAL: \$545,004
Prin. Invest.	NASA Tech. Officer	CASE Category
Raper, C. D., Jr.	ARC/MacElroy, R.	55-Agriculture Sci
Henry, L. T.		

**NASA'S UNIVERSITY PROGRAM
NORTH CAROLINA (Continued)**

NAG 1-932 University of North Carolina - Chapel Hill 4821
Identification of bacteria and organic molecules associated with sedimentary methane production using gas chromatography mass spectrometry

Period	Obligations	
12/05/88-06/30/90	FY89: \$30,000	TOTAL: \$30,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Martens, C. S.	LARC/Bartlett, D. S.	31-Atmos Sci

NAG 2-181 University of North Carolina - Chapel Hill 4822
Biochemical changes in bone in a model of weightlessness

Period	Obligations	
06/01/82-05/31/90	FY89: \$117,000	TOTAL: \$780,128
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Mechanic, G.	ARC/Arnaud, S. B.	56-Medical Sciences

NAG 2-391 University of North Carolina - Chapel Hill 4823
Fluid movement in bone its relation to mineral dynamics and hypogravic osteoporosis

Period	Obligations	
05/01/86-10/31/89	FY89: \$38,760	TOTAL: \$207,516
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Dillaman, R. M.	ARC/Arnaud, S. B.	51-Biological Sci
Roer, R. D.		

NAG 2-570 University of North Carolina - Chapel Hill 4824
Fuzzy logic inference processor development of a single board system and programming environment

Period	Obligations	
01/01/89-12/31/89	FY89: \$8,000	TOTAL: \$8,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Watanabe, H.	ARC/Lum, H.	22-Computer Science
	ARC/McKellar, D.	

NAGW 593 University of North Carolina - Chapel Hill 4825
Radon-222 tracing of biogenic gas fluxes from methane-saturated environments

Period	Obligations	
04/01/84-06/30/88	FY89:	TOTAL: \$430,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Martens, C. S.	HQ-EB/Averner, M. M.	39-Env Sci, NEC
	HQ-EB/Devincenzi, D. L.	

NAGW 834 University of North Carolina - Chapel Hill 4826
Seasonal variations in isotopic signatures of methane produced in organic-rich environments

Period	Obligations	
10/01/85-06/30/89	FY89: \$20,931	TOTAL: \$264,632
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Martens, C. S.	HQ-EE/Kurylo, M. J.	39-Env Sci, NEC
	HQ-EE/Watson, R. T.	

NAGW 926 University of North Carolina - Chapel Hill 4827
Analysis of spatial moisture soil temperature and plant biomass recognition and evaluation by the NOAA advanced very high resolution radiometer and the LANDSAT multispectral scanner

Period	Obligations	
09/01/86-08/31/89	FY89: \$100,000	TOTAL: \$300,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Walsh, S. J.	HQ-EE/Tuyahov, A. J.	39-Env Sci, NEC

NAGW 1455 University of North Carolina - Chapel Hill 4828
Radar tracing of biogenic gas fluxes from coastal wetlands and tidal freshwater esthones

Period	Obligations	
05/15/88-12/31/89	FY89: \$258,643	TOTAL: \$258,643
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Martens, C.	HQ-EB/Averner, M.	39-Env Sci, NEC

NAGW 1576 University of North Carolina - Chapel Hill 4829
Infrared spectroscopy of neutral and ionic water complexes of interest in comet and planetary atmosphere research

Period	Obligations	
12/01/88-11/30/89	FY89: \$39,925	TOTAL: \$39,925
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Miller, R. E.	HQ-EL/Bergstralh, J. T.	11-Astronomy

NGT 00-050-337 University of North Carolina - Chapel Hill 4830
NASA graduate student researchers program

Period	Obligations	
08/01/88-07/31/90	FY89: \$13,500	TOTAL: \$27,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Christiansen, W.	HQ-XE/Owens, F. C.	13-Physics

NAG 1-535 University of North Carolina, Charlotte 4831
Dynamics and control of flexible spacecraft during slewing maneuvers

Period	Obligations	
11/01/84-10/31/89	FY89: \$50,000	TOTAL: \$189,970
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Kakad, Y. P.	LARC/Armstrong, E. S.	45-Elec Engr
	LARC/Taylor, L. W.	

NAG 5-922 University of North Carolina, Charlotte 4832
An auto change mechanism and intelligent gripper for the space station

Period	Obligations	
06/01/87-04/14/89	FY89:	TOTAL: \$44,774
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
De Hoff, P. H.	GSFC/Vranish, J. M.	46-Mech Engr
Mahalingam, S.		
Yadaz, P.		

NAG 5-1053 University of North Carolina, Charlotte 4833
A magnets sensitive skin for robots in space

Period	Obligations	
07/15/88-07/14/90	FY89: \$30,000	TOTAL: \$60,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
De Hoff, P. H.	GSFC/Vranish, J. M.	13-Physics
Chauhan, D. S.		
Okpokowuruk, P. E.		

NAG 5-116S University of North Carolina, Charlotte 4834
Research relative to the magnetostrictive process for direct drive motors

Period	Obligations	
07/01/89-06/30/90	FY89: \$30,000	TOTAL: \$30,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Dehoff, P. H.	GSFC/Vranish, J. M.	46-Mech Engr
Naik, D. P.		

NAG10-57 University of North Carolina, Charlotte 4835
Air-conditioning system operating on a magnetic refrigeration cycle

Period	Obligations	
05/25/89-05/24/90	FY89: \$31,090	TOTAL: \$31,090
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Wang, P. L.	KSC/Howard, F. S.	46-Mech Engr

NASA'S UNIVERSITY PROGRAM **NORTH CAROLINA (Continued)**

NGT 00-050-253 University of North Carolina, Charlotte 4836

NASA graduate student researchers program

<i>Period</i>	<i>Obligations</i>	
09/16/87-09/15/90	FY89: \$18,000	TOTAL: \$36,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Daneshvar, K.	HQ-XE/Owens, F. C.	46-Mech Engr

NAG10-45 Wake Forest University 4837

Symbolic inversion based expert systems

<i>Period</i>	<i>Obligations</i>	
06/13/88-11/22/88	FY89:	TOTAL: \$28,119
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Thomas, S. J.	KSC/Belton, C.	99-Multi-Discip

NAS 2-10523 Wake Forest University 4838

Life science experiment ARC 781-127, correlation macro and microcirculatory alterations during weightlessness

<i>Period</i>	<i>Obligations</i>	
01/17/80-12/31/90	FY89: \$270,000	TOTAL: \$1,457,927
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hutchins, P. M.	ARC/Ferandin, J.	51-Biological Sci
	ARC/Sebesta, P. D.	

NCC 1-55 Wake Forest University 4839

Quantum chemical study of methane oxidation species

<i>Period</i>	<i>Obligations</i>	
06/04/81-07/18/90	FY89: \$29,261	TOTAL: \$193,828
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Jackels, C. F.	LARC/Phillips, D. H.	12-Chemistry
	LARC/Rogowski, R. S.	

NGT 00-070-081 Wake Forest University 4840

Graduate student researchers underrepresented minority focus program

<i>Period</i>	<i>Obligations</i>	
07/01/88-06/30/90	FY89: \$18,000	TOTAL: \$36,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hutchins, P.	HQ-XE/Owens, F. C.	51-Biological Sci

NORTH DAKOTA

NAGW 1033 University of North Dakota 4841

Interaction of environment and vegetation composition structure and function on a major tropical ecotone

<i>Period</i>	<i>Obligations</i>	
03/01/87-10/31/90	FY89: \$80,500	TOTAL: \$231,460
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Lieberman, D.	HQ-EE/Wickland, D. E.	39-Env Sci, NEC
Lieberman, M.	HQ-EE/Ruzek, M. J.	
Luvall, J. C.		

NASW 4455 University of North Dakota 4842

Investigation of the feasibility of applying low temperature plasma technology to a closed-loop processing resource management system

<i>Period</i>	<i>Obligations</i>	
09/21/89-03/20/90	FY89: \$30,000	TOTAL: \$30,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Rindt, J.	HQ-Z/Bekey, I.	31-Atmos Sci
	HQ-Z/Posey, G.	

OHIO

NGT 36-002-800 Bowling Green State University 4843

NASA graduate student researchers program

<i>Period</i>	<i>Obligations</i>	
07/15/85-08/25/88	FY89:	TOTAL: \$51,553
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Srinivasan, V.	HQ-LE/Owens, F. C.	12-Chemistry

NAG 1-856 Case Western Reserve University 4844

Stability of compressible free shear layers

<i>Period</i>	<i>Obligations</i>	
03/01/88-02/28/89	FY89:	TOTAL: \$27,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Reshotko, E.	LARC/Anders, J. B.	41-Aero Engr

NAG 3-2 Case Western Reserve University 4845

Improved and efficient laser anemometers

<i>Period</i>	<i>Obligations</i>	
11/01/79-10/31/89	FY89: \$63,000	TOTAL: \$661,396
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Edwards, R. V.	LERC/Seasholtz, R. G.	45-Elec Engr

NAG 3-61 Case Western Reserve University 4846

Model development for shock wave boundary layer interaction experiment

<i>Period</i>	<i>Obligations</i>	
04/24/80-10/30/87	FY89:	TOTAL: \$182,606
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Greber, I.	LERC/Hingst, W. R.	41-Aero Engr

NAG 3-230 Case Western Reserve University 4847

Boundary layer transition in a disturbed environment

<i>Period</i>	<i>Obligations</i>	
12/05/81-09/30/88	FY89:	TOTAL: \$329,743
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Reshotko, E.	LERC/O'Brien, J. E.	46-Mech Engr
	LERC/Simoneau, R. J.	

NAG 3-331 Case Western Reserve University 4848

Interactive dual-bearing/shaft finite elements for integrated engine structural analysis

<i>Period</i>	<i>Obligations</i>	
10/25/82-10/14/89	FY89:	TOTAL: \$260,664
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Adams, M. L.	LERC/Fleming, D. P.	41-Aero Engr
Fertis, D. G.	LERC/Steinetz, B. M.	

NAG 3-387 Case Western Reserve University 4849

Alloying additions to Ne Ap and FE al for high temperature applications

<i>Period</i>	<i>Obligations</i>	
01/15/83-01/09/89	FY89:	TOTAL: \$410,466
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Vedula, K. M.	LERC/Nathal, M. V.	47-Materials Engr
Hehemann, R. F.	LERC/Stephens, J. R.	

NAG 3-406 Case Western Reserve University 4850

Case early exposure to engineering for minority students and minority engineer industrial opportunity program

<i>Period</i>	<i>Obligations</i>	
03/25/83-06/14/90	FY89: \$16,129	TOTAL: \$148,118
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Boulding, M. E.	LERC/Lawrence, R. F.	49-Engr, NEC
	LERC/Biaglow, J. A.	

NASA'S UNIVERSITY PROGRAM
OHIO (Continued)

NAG 3-467 Case Western Reserve University 4851
 Study of combustion liner porous metal thermal barriers

Period	Obligations	
09/01/83-12/31/88	FY89:	TOTAL: \$223,425
Prin. Invest.	NASA Tech. Officer	CASE Category
Dybbs, A.	LERC/Acosta, W. A.	46-Mech Engr
	LERC/Ercegovic, D.	

NAG 3-520 Case Western Reserve University 4852
 Experiments in viscous flows in supersonic streams in 1 x 1 Lewis supersonic wind tunnel

Period	Obligations	
01/20/84-01/01/90	FY89: \$30,300	TOTAL: \$156,154
Prin. Invest.	NASA Tech. Officer	CASE Category
Greber, I.	LERC/Hingst, W. R.	41-Aero Engr

NAG 3-553 Case Western Reserve University 4853
 Generalized cumulative damage assessment under complex loading patterns and high temperatures

Period	Obligations	
05/15/84-10/31/88	FY89:	TOTAL: \$365,433
Prin. Invest.	NASA Tech. Officer	CASE Category
Manson, S. S.	LERC/Halford, G. R.	47-Materials Engr
	LERC/McGaw, M. A.	

NAG 3-567 Case Western Reserve University 4854
 Thermo/diffuso capillary motion

Period	Obligations	
07/27/84-05/15/89	FY89: \$35,386	TOTAL: \$341,245
Prin. Invest.	NASA Tech. Officer	CASE Category
Kamotani, Y.	LERC/Vernon, R. W.	49-Engr, NEC
Balasubramaniam, R.		

NAG 3-570 Case Western Reserve University 4855
 Surface-tension driven convection under reduced gravity conditions

Period	Obligations	
08/15/84-01/03/90	FY89: \$160,875	TOTAL: \$783,841
Prin. Invest.	NASA Tech. Officer	CASE Category
Ostrach, S.	LERC/Jacobson, T. P.	49-Engr, NEC
Kamotani, Y.		

NAG 3-648 Case Western Reserve University 4856
 Lifting surface theory for propelles configurations

Period	Obligations	
07/15/85-10/27/88	FY89:	TOTAL: \$261,894
Prin. Invest.	NASA Tech. Officer	CASE Category
Reshotko, E.	LERC/Bober, L. J.	41-Aero Engr
Ramachandra, S. M.		

NAG 3-653 Case Western Reserve University 4857
 Finite element analysis of thermomechanical response for a spray clutch assembly

Period	Obligations	
09/01/85-12/31/89	FY89: \$81,240	TOTAL: \$286,539
Prin. Invest.	NASA Tech. Officer	CASE Category
Mullen, R. L.	LERC/Radil, K. C.	46-Mech Engr
	LERC/Fleming, D. P.	

NAG 3-686 Case Western Reserve University 4858
 Heat flux sensor calibration

Period	Obligations	
12/30/85-02/28/90	FY89: \$76,450	TOTAL: \$303,800
Prin. Invest.	NASA Tech. Officer	CASE Category
Dybbs, A.	LERC/Liebert, C. H.	46-Mech Engr

NAG 3-688 Case Western Reserve University 4859
 Molecular orbital studies in oxide metal bonding

Period	Obligations	
01/02/86-12/31/88	FY89:	TOTAL: \$88,087
Prin. Invest.	NASA Tech. Officer	CASE Category
Anderson, A. B.	LERC/Smialek, J. L.	12-Chemistry

NAG 3-694 Case Western Reserve University 4860
 Research in batteries and fuel cells to obtain higher performance and extended cycle life for space application

Period	Obligations	
01/25/86-01/31/90	FY89:	TOTAL: \$595,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Tryk, D. A.	LERC/Hagedorn, N. H.	43-Chem Engr
Liu, C. C.	LERC/O'donnell, P. M.	

NAG 3-696 Case Western Reserve University 4861
 Oxygen interaction with space power material

Period	Obligations	
05/01/86-12/14/89	FY89:	TOTAL: \$286,485
Prin. Invest.	NASA Tech. Officer	CASE Category
Ech, T. G.	LERC/Ferguson, D. C.	12-Chemistry
Hoffman, R. W.	LERC/Purvis, C. K.	

NAG 3-698 Case Western Reserve University 4862
 Investigation of electronic structure of defects in gallium arsenide

Period	Obligations	
02/05/86-06/02/90	FY89: \$29,996	TOTAL: \$109,996
Prin. Invest.	NASA Tech. Officer	CASE Category
Segall, B.	LERC/Good, B. S.	13-Physics

NAG 3-700 Case Western Reserve University 4863
 Stirling engine flow and heat transfer problems

Period	Obligations	
02/10/86-02/28/90	FY89: \$45,000	TOTAL: \$146,510
Prin. Invest.	NASA Tech. Officer	CASE Category
Dybbs, A.	LERC/Tew, R. C.	49-Engr, NEC
	LERC/Dudenhofer, J. E.	

NAG 3-707 Case Western Reserve University 4864
 Generalized substructuring utilizing mixed modal and physical representations

Period	Obligations	
04/01/86-07/01/89	FY89: \$10,000	TOTAL: \$145,859
Prin. Invest.	NASA Tech. Officer	CASE Category
Huckelbridge, A.	LERC/Lawrence, C.	41-Aero Engr
	LERC/Kiraly, L. J.	

NAG 3-725 Case Western Reserve University 4865
 Numerical calculations of 3-D separated flows

Period	Obligations	
04/25/86-12/23/89	FY89: \$40,000	TOTAL: \$168,600
Prin. Invest.	NASA Tech. Officer	CASE Category
Greber, I.	LERC/Sockol, P. M.	41-Aero Engr

NAG 3-740 Case Western Reserve University 4866
 Foaming in glass melts under microgravity

Period	Obligations	
09/01/86-08/31/89	FY89: \$30,000	TOTAL: \$174,514
Prin. Invest.	NASA Tech. Officer	CASE Category
Hrma, P.	LERC/Jaskowiak, M. H.	49-Engr, NEC
Lhan, A. I.		

NASA'S UNIVERSITY PROGRAM

OHIO (Continued)

NAG 3-758 Case Western Reserve University 4867
 Structural and electrical characterization of lattice defects in B SiC
Period Obligations
 11/20/86-11/19/89 FY89: \$107,026 TOTAL: \$244,128
Prin. Invest. NASA Tech. Officer CASE Category
 Pirouz, P. LERC/Powell, J. A. 47-Materials Engr

NAG 3-761 Case Western Reserve University 4868
 Reactionless robots for a micro gravity environment
Period Obligations
 12/01/86-02/28/90 FY89: \$43,006 TOTAL: \$119,932
Prin. Invest. NASA Tech. Officer CASE Category
 Quinn, R. D. LERC/Lawrence, C. 46-Mech Engr

NAG 3-769 Case Western Reserve University 4869
 Controlled matrix and interface structures for improved processibility in ceramic composites
Period Obligations
 12/20/86-10/24/89 FY89: \$36,500 TOTAL: \$104,967
Prin. Invest. NASA Tech. Officer CASE Category
 Ishida, H. LERC/Hurwitz, F. I. 47-Materials Engr

NAG 3-785 Case Western Reserve University 4870
 Enhanced processing of ceramic composites through colloidal engineering
Period Obligations
 03/01/87-04/14/89 FY89: \$32,064 TOTAL: \$318,850
Prin. Invest. NASA Tech. Officer CASE Category
 Feke, D. L. LERC/Freedman, M. R. 47-Materials Engr

NAG 3-788 Case Western Reserve University 4871
 Intelligent control research
Period Obligations
 03/07/87-05/31/90 FY89: \$57,006 TOTAL: \$157,468
Prin. Invest. NASA Tech. Officer CASE Category
 Loparo, U. A. LERC/Litt, J. S. 49-Engr, NEC
 Letkowitz, I.

NAG 3-795 Case Western Reserve University 4872
 Interaction if molecules and particles by analysis of computed trajectories
Period Obligations
 04/01/87-03/31/90 FY89: \$92,740 TOTAL: \$191,490
Prin. Invest. NASA Tech. Officer CASE Category
 Greber, I. LERC/Ferguson, D. C. 13-Physics
 Wachman, H./Purvis, C. K.

NAG 3-800 Case Western Reserve University 4873
 Two level structure for advanced space power system automation
Period Obligations
 05/30/87-05/28/90 FY89: \$40,050 TOTAL: \$129,244
Prin. Invest. NASA Tech. Officer CASE Category
 Loparo, K. A. LERC/Kish, J. A. 45-Elec Engr
 Chankong, V. LERC/Faymon, K. A.

NAG 3-809 Case Western Reserve University 4874
 Transient model of a catalytic thruster
Period Obligations
 07/03/87-03/01/90 FY89: \$25,200 TOTAL: \$100,000
Prin. Invest. NASA Tech. Officer CASE Category
 T'ien, J. S. LERC/Armstrong, E. S. 41-Aero Engr
 Lee, S. T.

NAG 3-814 Case Western Reserve University 4875
 Anisotropy in high TC superconductors
Period Obligations
 08/01/87-12/01/89 FY89: \$50,505 TOTAL: \$130,262
Prin. Invest. NASA Tech. Officer CASE Category
 Farrell, D. E. LERC/Aron, P. R. 13-Physics
 Chandrasekhan, B. S.

NAG 3-816 Case Western Reserve University 4876
 Experimental studies of propagation characteristics in coplanar wave guide and its application in nondestructive evaluation of semiconductors
Period Obligations
 08/08/87-01/20/90 FY89: \$130,000 TOTAL: \$286,819
Prin. Invest. NASA Tech. Officer CASE Category
 Tabib-azar, M. LERC/Leonard, R. F. 45-Elec Engr
 Simons, R.

NAG 3-831 Case Western Reserve University 4877
 Monodisperse seedey for laser anemometry using condensation technique
Period Obligations
 11/07/87-11/05/89 FY89: \$50,000 TOTAL: \$99,869
Prin. Invest. NASA Tech. Officer CASE Category
 Kadambi, J. R. LERC/Seasholtz, R. G. 49-Engr, NEC

NAG 3-832 Case Western Reserve University 4878
 Inversion of the X ray transform from data in a limited angular range
Period Obligations
 11/07/87-11/05/89 FY89: \$35,000 TOTAL: \$69,999
Prin. Invest. NASA Tech. Officer CASE Category
 Izen, S. H. LERC/Decker, A. J. 21-Mathematics

NAG 3-840 Case Western Reserve University 4879
 Low Prandtl number convection in floating zone
Period Obligations
 11/30/87-12/29/88 FY89: TOTAL: \$50,000
Prin. Invest. NASA Tech. Officer CASE Category
 Ostrach, S. LERC/Gray, H. R. 13-Physics
 Kamotani, Y.

NAG 3-856 Case Western Reserve University 4880
 Fracture mechanics of ceramic matrix composites
Period Obligations
 12/30/87-12/29/89 FY89: \$56,126 TOTAL: \$106,888
Prin. Invest. NASA Tech. Officer CASE Category
 Ballarini, R. LERC/Gross, B. 47-Materials Engr

NAG 3-878 Case Western Reserve University 4881
 Laser enhanced crystal growth in a microgravity environment
Period Obligations
 02/28/88-09/05/89 FY89: TOTAL: \$180,808
Prin. Invest. NASA Tech. Officer CASE Category
 Claspy, P. C. LERC/Chait, A. 47-Materials Engr
 LERC/Johnston, J. C.

NAG 3-886 Case Western Reserve University 4882
 Gravity dependent transport in industrial processes
Period Obligations
 04/15/88-04/14/91 FY89: \$300,000 TOTAL: \$500,000
Prin. Invest. NASA Tech. Officer CASE Category
 Ostrach, S. LERC/Ratajczak, A. J. 45-Elec Engr
 Kamotani, Y.

NASA'S UNIVERSITY PROGRAM
OHIO (Continued)

NAG 3-907 Case Western Reserve University 4883
 Space station power system autonomous control
Period Obligations
 05/20/88-05/19/89 FY89: TOTAL: \$25,000
Prin. Invest. NASA Tech. Officer CASE Category
 Sterling, L. LERC/Bobinsky, E. A. 22-Computer Science
 Vezina, J. M.

NAG 3-922 Case Western Reserve University 4884
 Investigate the use of parallel associative memory technology in space station power systems autonomous control
Period Obligations
 08/01/88-07/31/90 FY89: \$45,000 TOTAL: \$90,000
Prin. Invest. NASA Tech. Officer CASE Category
 Pao, Y. LERC/Dolce, J. L. 45-Elec Engr
 Sobajic, D. J. LERC/Sellers, J. F.

NAG 3-931 Case Western Reserve University 4885
 Hypersonic propulsion
Period Obligations
 09/21/88-06/20/89 FY89: TOTAL: \$99,200
Prin. Invest. NASA Tech. Officer CASE Category
 Resler, E. L. LERC/Newman, F. A. 41-Aero Engr

NAG 3-932 Case Western Reserve University 4886
 Premixed hydrogen-air for scramjet combustion
Period Obligations
 10/01/88-09/30/89 FY89: TOTAL: \$9,998
Prin. Invest. NASA Tech. Officer CASE Category
 Reshotko, E. LERC/Simoneau, R. J. 46-Mech Engr

NAG 3-939 Case Western Reserve University 4887
 Generalized nonlinear cumulative fatigue damage theory for high temperature
Period Obligations
 11/16/88-11/16/89 FY89: \$106,158 TOTAL: \$106,158
Prin. Invest. NASA Tech. Officer CASE Category
 Manson, S. S. LERC/Halford, G. R. 47-Materials Engr
 LERC/McGaw, M. A.

NAG 3-954 Case Western Reserve University 4888
 Electronic and total energy properties of tenary and quaternary compounds alloys and superlatives in the ga system
Period Obligations
 12/01/88-11/30/89 FY89: \$18,445 TOTAL: \$18,445
Prin. Invest. NASA Tech. Officer CASE Category
 Lambrecht, W. R. LERC/Good, B. S. 13-Physics

NAG 3-980 Case Western Reserve University 4889
 Rotordynamic coefficients of hydro static bearings
Period Obligations
 02/01/89-01/31/90 FY89: \$40,125 TOTAL: \$40,125
Prin. Invest. NASA Tech. Officer CASE Category
 Adams, M. L. LERC/Capaldi, R. J. 46-Mech Engr

NAG 3-1003 Case Western Reserve University 4890
 Neural net modeling in structural optimization
Period Obligations
 02/06/89-12/05/89 FY89: \$25,000 TOTAL: \$25,000
Prin. Invest. NASA Tech. Officer CASE Category
 Sobajic, D. J. LERC/Berke, L. 46-Mech Engr

NAG 3-1027 Case Western Reserve University 4891
 Optimal design of orthopaedic implants
Period Obligations
 04/10/89-04/09/90 FY89: \$60,000 TOTAL: \$60,000
Prin. Invest. NASA Tech. Officer CASE Category
 Davy, D. T. ARC/Hopkins, D. A. 49-Engr, NEC
 ARC/Chamis, C. C.

NAG 3-1046 Case Western Reserve University 4892
 Modeling of solid fuel combustion in very low speed oxygen streams
Period Obligations
 05/17/89-10/16/89 FY89: \$22,320 TOTAL: \$22,320
Prin. Invest. NASA Tech. Officer CASE Category
 T'ien, J. S. LERC/Salzman, J. A. 49-Engr, NEC

NAG 3-1077 Case Western Reserve University 4893
 Electrochemically induced nuclear fusion
Period Obligations
 09/25/89-09/25/90 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
 Yeager, E. B. LERC/Fieldier, W. L. 12-Chemistry
 Adzic, R. LERC/Reid, M. A.

NAGW 451 Case Western Reserve University 4894
 Gamtrac telescope improved angular revolution for gamma ray astronomy
Period Obligations
 04/01/83-01/31/90 FY89: \$128,514 TOTAL: \$1,091,448
Prin. Invest. NASA Tech. Officer CASE Category
 Frye Jr., G. M. HQ-EZ/Kaluzienski, L. J. 11-Astronomy
 Jenkins, F. L. HQ-EZ/Bunner, A. N.

NAGW 1193 Case Western Reserve University 4895
 Center for the commercialization of space
Period Obligations
 10/01/87-10/31/89 FY89: \$800,000 TOTAL: \$1,713,000
Prin. Invest. NASA Tech. Officer CASE Category
 Wallace, J. F. HQ-IC/Oran, W. A. 99-Multi-Discip
 Baer, E. HQ/Whitten, R. P.

NAS 5-29423 Case Western Reserve University 4896
 The development of a cerebrospinal fluid (CSF) control system
Period Obligations
 02/14/86-07/03/90 FY89: \$358,475 TOTAL: \$2,039,537
Prin. Invest. NASA Tech. Officer CASE Category
 Ko, W. H. GSFC/Friedman, D. S. 56-Medical Sciences
 Chizeck, H. J.
 Meyrick, C. W.

NAS 9-17439 Case Western Reserve University 4897
 Quantitation of effects of gravity upon human vertical vestibular and optokinetic responses
Period Obligations
 08/01/85-08/01/88 FY89: TOTAL: \$42,915
Prin. Invest. NASA Tech. Officer CASE Category
 Leigh, R. J. JSC/Harris, J. W. 56-Medical Sciences

NCC 3-25 Case Western Reserve University 4898
 Theoretical studies of the transport properties in selectivity doper III V semiconducting heterostructures
Period Obligations
 03/07/83-04/18/90 FY89: \$25,797 TOTAL: \$200,987
Prin. Invest. NASA Tech. Officer CASE Category
 Segall, B. LERC/Haugland, E. 13-Physics
 LERC/Alterovitz, S. A.

NASA'S UNIVERSITY PROGRAM
OHIO (Continued)

NCC 3-29 Case Western Reserve University 4899
 Microwave and millimeter wave active and passive circuit modeling design, and testing

Period	Obligations	
07/01/83-02/28/90	FY89: \$33,859	TOTAL: \$369,688
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Collin, R. E.	LERC/Ponchak, G. E.	45-Elec Engr

NCC 3-80 Case Western Reserve University 4907
 Use of supercritical ammonia in ceramic processing

Period	Obligations	
02/28/87-08/30/88	FY89:	TOTAL: \$30,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Adler, R. J.	LERC/Philipp, W. H.	12-Chemistry
Angus, J. C.		

NCC 3-30 Case Western Reserve University 4900
 Transient elastohydrodynamic lubrication in starved conjunctions

Period	Obligations	
05/15/83-03/04/90	FY89: \$189,850	TOTAL: \$901,990
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Prahl, J. M.	LERC/Brewe, D. E.	46-Mech Engr
Jeng, J. R.	LERC/Loomis, W. R.	

NCC 3-82 Case Western Reserve University 4908
 Synthesis and characterization of ceramics and composites

Period	Obligations	
04/01/87-05/30/90	FY89:	TOTAL: \$199,285
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Cooper, A. R.	LERC/Jaskowiak, M. H.	47-Materials Engr

NCC 3-40 Case Western Reserve University 4901
 Study of electron beam lithography

Period	Obligations	
09/01/84-02/28/90	FY89: \$29,414	TOTAL: \$129,956
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Gordon, W. L.	LERC/Bhasin, K. B.	45-Elec Engr
	LERC/Leonard, R. F.	

NCC 3-85 Case Western Reserve University 4909
 Absolute ignition delay times for hydrogen oxygen combustion from measurements made new the end wall of a shock tube

Period	Obligations	
06/01/87-08/30/89	FY89: \$26,625	TOTAL: \$68,250
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Prahl, J. M.	LARC/Rabinowitz, M. J.	12-Chemistry

NCC 3-42 Case Western Reserve University 4902
 Case/NASA cooperation aerospace R and D fellowship program

Period	Obligations	
06/01/84-05/31/89	FY89:	TOTAL: \$3,206,159
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
McKeon, T. J.	LERC/Montegani, F. J.	49-Engr, NEC

NCC 3-87 Case Western Reserve University 4910
 High speed mixing layer with chemical reaction

Period	Obligations	
06/05/87-02/04/90	FY89: \$39,000	TOTAL: \$85,700
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Tien, J. S.	LERC/Marek, C. J.	46-Mech Engr

NCC 3-43 Case Western Reserve University 4903
 Environmental degradation of combustion turbine hot-section materials

Period	Obligations	
07/15/84-12/17/88	FY89:	TOTAL: \$402,421
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Vedula, K.	LERC/Stearns, C. A.	19-Phys Sci, NEC
Misra, A. K.		

NCC 3-94 Case Western Reserve University 4911
 Increased thermal fatigue resistance of copper based alloys through rapid solidification processing

Period	Obligations	
07/30/87-07/28/90	FY89: \$28,272	TOTAL: \$34,272
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Michal, G. M.	LERC/Gray, H. R.	47-Materials Engr
Ellis, D. L.		

NCC 3-71 Case Western Reserve University 4904
 Universal features of the energetics of solids and liquids

Period	Obligations	
10/15/86-09/30/90	FY89: \$22,738	TOTAL: \$83,523
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Gordon, W. L.	LERC/Ferrante, J.	13-Physics

NCC 3-97 Case Western Reserve University 4912
 Screen printing of high to superconductors for microwave and sensor related applications

Period	Obligations	
11/01/87-11/01/89	FY89: \$5,000	TOTAL: \$5,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Liu, C. C.	LERC/Alterovitz, S. A.	45-Elec Engr

NCC 3-73 Case Western Reserve University 4905
 A theoretical and experimental investigation of pyrolytic coatings of materials by chemical vapor disposition

Period	Obligations	
11/20/86-12/17/89	FY89: \$150,211	TOTAL: \$388,142
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Pirouz, P.	LERC/Stearns, C. A.	19-Phys Sci, NEC
Gokoglu, S.	LERC/Behrendt, D. R.	

NCC 3-99 Case Western Reserve University 4913
 High frequency wide bandwidth analog optical communication

Period	Obligations	
12/01/87-01/01/90	FY89: \$30,719	TOTAL: \$69,738
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Claspy, P. C.	LERC/Bhasin, K. B.	45-Elec Engr
	LERC/Leonard, R. F.	

NCC 3-74 Case Western Reserve University 4906
 Solidification fundamentals

Period	Obligations	
12/01/86-03/31/90	FY89: \$47,361	TOTAL: \$1,153,930
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Laxmanan, V.	LERC/Glasgow, T. K.	47-Materials Engr
Wallace, J. F.	LERC/Rosenthal, B. N.	

NCC 3-103 Case Western Reserve University 4914
 Phase shifting interferometry to measure object displacement

Period	Obligations	
12/05/87-12/04/89	FY89: \$40,211	TOTAL: \$62,133
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Haacke, E. M.	LERC/Decker, A. J.	19-Phys Sci, NEC

NASA'S UNIVERSITY PROGRAM
OHIO (Continued)

NCC 3-108 Case Western Reserve University 4915
 Light scattering techniques for the characterization of colloidal particles

<i>Period</i>	<i>Obligations</i>	
03/05/88-01/31/90	FY89: \$12,000	TOTAL: \$30,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Qutubuddin, S.	LERC/Glasgow, T. K.	47-Materials Engr
	LERC/Johnston, J. C.	

NCC 3-112 Case Western Reserve University 4916
 Synthesis and processing of advanced polymer systems

<i>Period</i>	<i>Obligations</i>	
06/25/88-11/30/89	FY89: \$88,794	TOTAL: \$134,281
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Jukenik, C. N.	LERC/Meador, M. A.	12-Chemistry
	LERC/Sutter, J. K.	

NCC 3-115 Case Western Reserve University 4917
 Maximum likelihood based software for particle sized statistics measured using qels

<i>Period</i>	<i>Obligations</i>	
09/01/88-08/31/90	FY89: \$50,000	TOTAL: \$95,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Edwards, R. V.	LERC/Glasgow, T. K.	47-Materials Engr

NCC 3-118 Case Western Reserve University 4918
 MOCVD deposition of photovoltaic material

<i>Period</i>	<i>Obligations</i>	
12/01/88-11/30/89	FY89: \$79,023	TOTAL: \$79,023
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hoffman, R. W.	LERC/Weinberg, I.	13-Physics
	LERC/Flood, D. J.	

NCC 3-123 Case Western Reserve University 4919
 Anisotropy in high TC superconductors

<i>Period</i>	<i>Obligations</i>	
01/01/89-12/31/89	FY89: \$54,410	TOTAL: \$54,410
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Farrell, D. E.	LERC/Levine, S. R.	99-Multi-Discip

NCC 3-124 Case Western Reserve University 4920
 Environmental effects on transition and the control of transition

<i>Period</i>	<i>Obligations</i>	
11/22/88-11/22/89	FY89: \$160,000	TOTAL: \$160,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Reshotko, E.	LERC/Povinelli, L. A.	41-Aero Engr

NCC 3-129 Case Western Reserve University 4921
 Preparation and characterization of ceramic superconductor fibers

<i>Period</i>	<i>Obligations</i>	
02/01/89-01/31/90	FY89: \$92,958	TOTAL: \$92,958
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Dequire, M. R.	LERC/Levine, S. R.	47-Materials Engr

NCC 3-131 Case Western Reserve University 4922
 Laser light scattering hard for micro gravity experiments

<i>Period</i>	<i>Obligations</i>	
04/01/89-08/31/90	FY89: \$98,917	TOTAL: \$98,917
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Mann, J. A.	LERC/Glasgow, T. K.	49-Engr, NEC
Ansari, R. R.		

NCC 3-133 Case Western Reserve University 4923
 Synthesis and characterization of high tech ceramics and composites

<i>Period</i>	<i>Obligations</i>	
04/01/89-12/31/89	FY89: \$96,869	TOTAL: \$96,869
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Bansal, N. P.	LERC/Jaskowiak, M. H.	47-Materials Engr
Cooper, A. R.	LERC/Levine, S. R.	

NCC 3-134 Case Western Reserve University 4924
 Enhanced processing of ceramic composites through colloidal engineering

<i>Period</i>	<i>Obligations</i>	
03/15/89-03/14/90	FY89: \$244,968	TOTAL: \$244,968
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Feke, D. L.	LERC/Freedman, M. R.	47-Materials Engr

NCC 3-137 Case Western Reserve University 4925
 Case NASA cooperative aerospace R and D fellowship program

<i>Period</i>	<i>Obligations</i>	
05/12/89-05/11/90	FY89: \$948,730	TOTAL: \$948,730
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Schuele, D. E.	LERC/Montegani, F. J.	99-Multi-Discip

NCC 3-139 Case Western Reserve University 4926
 Ceramic processing

<i>Period</i>	<i>Obligations</i>	
05/01/89-09/30/92	FY89: \$49,140	TOTAL: \$49,140
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Williams, W. S.	LERC/Levine, S. R.	47-Materials Engr
Cawley, J.		

NCC 3-140 Case Western Reserve University 4927
 Thermocapillary and electrocapillary effects in reduced gravity

<i>Period</i>	<i>Obligations</i>	
05/15/89-05/14/90	FY89: \$95,000	TOTAL: \$95,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Kamotani, Y.	LERC/Vernon, R. W.	46-Mech Engr

NCC 3-141 Case Western Reserve University 4928
 Oxygen interaction with space-power materials

<i>Period</i>	<i>Obligations</i>	
06/01/89-05/30/90	FY89: \$141,693	TOTAL: \$141,693
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Eck, T. G.	LERC/Ferguson, D. C.	13-Physics
Hoffman, R. W.	LERC/Purvis, C. K.	

NCC 3-144 Case Western Reserve University 4929
 Development of NiAl based alloys and composite materials for elevated temperature use

<i>Period</i>	<i>Obligations</i>	
06/28/89-12/27/90	FY89: \$47,832	TOTAL: \$47,832
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Michal, G. M.	LERC/Gray, H. R.	47-Materials Engr

NCC 3-147 Case Western Reserve University 4930
 Laser enhanced crystal growth in a microgravity environment

<i>Period</i>	<i>Obligations</i>	
09/06/89-09/05/90	FY89: \$109,999	TOTAL: \$109,999
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Claspy, P. C.	LERC/Rosenthal, B. N.	47-Materials Engr
	LERC/Glasgow, T. K.	

NASA'S UNIVERSITY PROGRAM
OHIO (Continued)

NGT 00-050-087 Case Western Reserve University 4931
 NASA graduate student researchers program
Period *Obligations*
 08/25/86-08/24/89 FY89: TOTAL: \$72,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Michal, G. M. HQ-XE/Owens, F. C. 47-Materials Engr

NGT 00-050-088 Case Western Reserve University 4932
 NASA graduate student researchers program
Period *Obligations*
 06/01/86-05/31/89 FY89: TOTAL: \$54,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 T'ien, J. S. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 00-050-136 Case Western Reserve University 4933
 NASA graduate student researchers program
Period *Obligations*
 06/01/87-05/31/90 FY89: TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Sukenik, C. N. HQ-XE/Owens, F. C. 12-Chemistry

NGT 00-050-140 Case Western Reserve University 4934
 NASA graduate student researchers program
Period *Obligations*
 06/01/87-12/31/89 FY89: TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Korczak, K. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 00-050-141 Case Western Reserve University 4935
 NASA graduate student researchers program
Period *Obligations*
 06/01/87-05/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Qutubuddin, S. HQ-XE/Owens, F. C. 43-Chem Engr

NGT 00-050-375 Case Western Reserve University 4936
 NASA graduate student researchers program
Period *Obligations*
 08/01/88-07/31/90 FY89: TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Youngs, W. HQ-XE/Owens, F. C. 12-Chemistry
 Youngs, C. T.

NGT 00-050-440 Case Western Reserve University 4937
 NASA graduate student researchers program
Period *Obligations*
 06/01/89-05/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Klopman, G. HQ-XE/Owens, F. C. 12-Chemistry

NGT 00-050-448 Case Western Reserve University 4938
 NASA graduate student researchers program
Period *Obligations*
 07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Ostrach, S. HQ-XE/Owens, F. C. 19-Phys Sci, NEC

NGT 00-050-504 Case Western Reserve University 4939
 NASA graduate student researchers program
Period *Obligations*
 06/01/89-05/31/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 T'ien, J. S. HQ-XE/Owens, F. C. 19-Phys Sci, NEC

NGT 36-027-011 Case Western Reserve University 4940
 Summer program of NASA-ASEE summer faculty fellowships
Period *Obligations*
 12/16/69-03/31/90 FY89: \$315,767 TOTAL: \$5,436,457
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Pahl, J. M. HQ-XE/McGee, A. S. 49-Engr, NEC
 HQ-XE/Schwartz, E. T.

NAGW 1336 Central State University - Ohio 4941
 Servomotor linked articulated versatile end effect
Period *Obligations*
 06/12/88-09/30/89 FY89: TOTAL: \$125,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Grisson, W. A. JPL/Kan, E. P. 46-Mech Engr

NAG 3-138 Cleveland State University 4942
 NASA-Cleveland State University internship program
Period *Obligations*
 12/15/80-11/10/88 FY89: TOTAL: \$128,011
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Goradia, C. LERC/Weinberg, I. 13-Physics
 Goradia, M. G. LERC/Flood, D.

NAG 3-241 Cleveland State University 4943
 Effect of heat treatment of electrical contacts to gallium arsenide
Period *Obligations*
 12/15/81-01/31/90 FY89: TOTAL: \$147,315
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Goradia, M. G. LERC/Flood, D. J. 45-Elec Engr
 LERC/Brinker, D. J.

NAG 3-249 Cleveland State University 4944
 Theory of gallium arsenide solar cells with sunlight concentration up to 100X
Period *Obligations*
 01/04/82-02/27/90 FY89: TOTAL: \$215,238
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Goradia, C. LERC/Brinker, D. J. 45-Elec Engr

NAG 3-548 Cleveland State University 4945
 Unsteady flow and heat transfer in turbomachinery
Period *Obligations*
 04/15/84-12/01/90 FY89: \$15,334 TOTAL: \$226,447
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Gorla, R. S. LERC/Sokol, P. M. 41-Aero Engr

NAG 3-550 Cleveland State University 4946
 Development and computer implementation of design/analysis techniques for multilayered composite structures
Period *Obligations*
 09/01/84-10/01/90 FY89: TOTAL: \$346,334
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Bellini, P. LERC/Chamis, C. C. 41-Aero Engr
 Murthy, P. L. LERC/Johns, R. H.

NAG 3-658 Cleveland State University 4947
 Theory of indium phosphide solar cells
Period *Obligations*
 10/05/85-10/10/89 FY89: \$260,900 TOTAL: \$526,551
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Goradia, C. LERC/Weinberg, I. 45-Elec Engr
 Goradia, M. LERC/Brinker, D. J.

NASA'S UNIVERSITY PROGRAM
OHIO (Continued)

NAG 3-748 Cleveland State University 4948
Improved boundary layer heat transfer calculations near a stagnation point
Period Obligations
10/10/86-07/08/89 FY89: TOTAL: \$23,843
Prin. Invest. NASA Tech. Officer CASE Category
Ibrahim, M. B. LERC/Boyle, R. J. 41-Aero Engr

NAG 3-749 Cleveland State University 4949
A high temperature testing system for ceramic composites
Period Obligations
10/25/86-10/23/90 FY89: \$102,370 TOTAL: \$176,799
Prin. Invest. NASA Tech. Officer CASE Category
Hemann, J. H. LERC/Hurwitz, F. I. 47-Materials Engr

NAG 3-873 Cleveland State University 4950
Electrical and magnetic properties of high temperature superconductors
Period Obligations
02/15/88-02/14/89 FY89: TOTAL: \$9,812
Prin. Invest. NASA Tech. Officer CASE Category
Hambourgen, P. D. LERC/Aron, P. R. 13-Physics

NAG 3-879 Cleveland State University 4951
Adaptation of reliability analysis program of structural ceramic components
scare to ansys m host and NASTRAN
Period Obligations
03/01/88-11/30/89 FY89: \$19,000 TOTAL: \$75,000
Prin. Invest. NASA Tech. Officer CASE Category
Pintz, A. LERC/Manderscheid, J. M. 46-Mech Engr

NAG 3-889 Cleveland State University 4952
Analyzing a self diagnostic system for piezoelectric sensors
Period Obligations
04/01/88-09/30/89 FY89: TOTAL: \$72,408
Prin. Invest. NASA Tech. Officer CASE Category
Atherton, W. J. LERC/Madzsar, G. C. 49-Engr, NEC
Flanagan, P. M.

NAG 3-924 Cleveland State University 4953
Thermal properties of pressurized materials
Period Obligations
08/15/88-08/14/89 FY89: TOTAL: \$16,477
Prin. Invest. NASA Tech. Officer CASE Category
Kaufman, M. LERC/Ferrante, J. 13-Physics

NAG 3-955 Cleveland State University 4954
Multi-dimensional Stirling engine design code
Period Obligations
11/01/88-10/31/89 FY89: \$49,991 TOTAL: \$49,991
Prin. Invest. NASA Tech. Officer CASE Category
Ibrahim, M. B. LERC/Tew, R. C. 49-Engr, NEC
LERC/Dudenhoefer, J. E.

NAG 3-971 Cleveland State University 4955
Oscillating flow and heat transfer in a channel with sudden cross sections
change
Period Obligations
01/01/89-12/31/89 FY89: \$34,983 TOTAL: \$34,983
Prin. Invest. NASA Tech. Officer CASE Category
Ibrahim, M. B. LERC/Tew, R. C. 49-Engr, NEC
LERC/Dudenhoefer, J. R.

NAG 3-1008 Cleveland State University 4956
Development of a model of space station photovoltaic array
Period Obligations
01/30/89-09/14/90 FY89: \$74,465 TOTAL: \$74,465
Prin. Invest. NASA Tech. Officer CASE Category
Bosela, P. LERC/McAleese, J. D. 46-Mech Engr

NAG 3-1010 Cleveland State University 4957
Flow visualization studies of the mixing process in a proposed circular
combustion for HSCT applications
Period Obligations
02/07/89-02/06/90 FY89: \$57,127 TOTAL: \$57,127
Prin. Invest. NASA Tech. Officer CASE Category
Ghorashi, B. LERC/Chun, K. S. 41-Aero Engr

NAG 3-1067 Cleveland State University 4958
Development of an office/lab space allocatrim plan using ie methods
Period Obligations
08/14/89-03/13/90 FY89: \$66,627 TOTAL: \$66,627
Prin. Invest. NASA Tech. Officer CASE Category
Svestka, J. A. LERC/Stevenson, E. F. 49-Engr, NEC
Liou, Y. A. LERC/Gregory, J. W.

NAG 8-91 Cleveland State University 4959
Effects of low gravity on microsegregation in directionally solidified
superalloy
Period Obligations
06/19/87-06/28/90 FY89: \$15,999 TOTAL: \$95,927
Prin. Invest. NASA Tech. Officer CASE Category
Tewari, S. N. MSFC/Lee, J. E. 47-Materials Engr
MSFC/Spray, C. T.

NCC 3-17 Cleveland State University 4960
Computerized mathematical model for optimizing cost and electric output
of phosphoric acid fuel cells
Period Obligations
03/09/81-01/19/90 FY89: TOTAL: \$268,164
Prin. Invest. NASA Tech. Officer CASE Category
Alkasab, K. A. LERC/Presler, A. F. 46-Mech Engr

NCC 3-19 Cleveland State University 4961
Terrestrial space energetics and power systems
Period Obligations
09/01/82-02/28/90 FY89: \$193,358 TOTAL: \$812,781
Prin. Invest. NASA Tech. Officer CASE Category
Hambourger, P. D. LERC/Rutledge, S. K. 43-Chem Engr
Shah, D. B. LERC/Banks, B. A.

NCC 3-23 Cleveland State University 4962
Phosphoric-acid fuel cell technology development
Period Obligations
11/22/82-12/29/89 FY89: \$133,168 TOTAL: \$1,059,997
Prin. Invest. NASA Tech. Officer CASE Category
Coulman, G. LERC/Prokopius, P. R. 43-Chem Engr
Antoine, B. LERC/Smith, J. M.
Alkasab, K.

NCC 3-24 Cleveland State University 4963
Detection and characterization of flows in ceramic materials
Period Obligations
02/15/83-03/30/90 FY89: TOTAL: \$270,668
Prin. Invest. NASA Tech. Officer CASE Category
Hemann, J. H. LERC/Klima, S. J. 47-Materials Engr
Baaklini, G. Y.

NASA'S UNIVERSITY PROGRAM
OHIO (Continued)

NCC 3-27 Cleveland State University 4964
 Mechanical behavior of thermal barrier coatings for gas turbine blades
Period Obligations
 07/01/83-05/15/89 FY89: TOTAL: \$420,954
Prin. Invest. NASA Tech. Officer CASE Category
 Ponter, A. LERC/Miller, R. A. 47-Materials Engr
 Tewari, S.

NCC 3-66 Cleveland State University 4972
 Electronic heterodyne readout station
Period Obligations
 07/20/86-11/18/89 FY89: TOTAL: \$64,764
Prin. Invest. NASA Tech. Officer CASE Category
 Anthan, D. J. LERC/Lesco, D. J. 45-Elec Engr
 LERC/Decker, A. J.

NCC 3-41 Cleveland State University 4965
 Development of experimental capability for microgravity material science
Period Obligations
 04/25/84-01/22/90 FY89: \$212,942 TOTAL: \$925,896
Prin. Invest. NASA Tech. Officer CASE Category
 Kramerich, G. L. LERC/Glasgow, T. K. 29-Math/Computer, NEC
 LERC/Rosenthal, B. N.

NCC 3-68 Cleveland State University 4973
 Effects of thermal cycling on high temperature polymer composites
Period Obligations
 11/15/86-12/13/89 FY89: \$63,280 TOTAL: \$176,375
Prin. Invest. NASA Tech. Officer CASE Category
 Hemann, J. H. LERC/Vannucci, R. D. 44-Civil Engr
 Cavano, P. J. LERC/Bowles, K. J.

NCC 3-46 Cleveland State University 4966
 Modelling of high temperature fracture and fatigue processes
Period Obligations
 02/28/85-10/30/88 FY89: TOTAL: \$224,734
Prin. Invest. NASA Tech. Officer CASE Category
 Ghosn, L. LERC/Calomino, A. M. 47-Materials Engr
 LERC/Shannon, J. L.

NCC 3-72 Cleveland State University 4974
 Alloy development and mechanical properties of heat storage salts for solar dynamic applications
Period Obligations
 10/01/86-11/30/89 FY89: \$95,000 TOTAL: \$252,158
Prin. Invest. NASA Tech. Officer CASE Category
 Tewari, S. N. LERC/Wittenberger, J. D. 47-Materials Engr

NCC 3-47 Cleveland State University 4967
 Implementation of an on-line emission spectroscopy workstation
Period Obligations
 03/01/85-12/31/88 FY89: TOTAL: \$33,580
Prin. Invest. NASA Tech. Officer CASE Category
 Megargle, R. G. LERC/Crandall, K. S. 12-Chemistry
 Wilkes, R. J. LERC/Watson, G. K.

NCC 3-77 Cleveland State University 4975
 Advanced microsheet composite solar reflector for Leo applications
Period Obligations
 01/01/87-06/30/90 FY89: \$220,000 TOTAL: \$395,000
Prin. Invest. NASA Tech. Officer CASE Category
 Pintz, A. LERC/Savino, J. M. 47-Materials Engr
 LERC/Mroz, T.

NCC 3-50 Cleveland State University 4968
 Engineering analysis of the space station dynamic power system
Period Obligations
 05/01/85-09/12/89 FY89: TOTAL: \$201,757
Prin. Invest. NASA Tech. Officer CASE Category
 Evans, A. L. LERC/Trudell, J. J. 46-Mech Engr

NCC 3-81 Cleveland State University 4976
 Theories of failure for ceramic composite materials and their implementation into finite element codes
Period Obligations
 03/05/87-11/24/90 FY89: \$228,471 TOTAL: \$562,730
Prin. Invest. NASA Tech. Officer CASE Category
 Hemann, J. H. LERC/Gyekenyesi, J. P. 47-Materials Engr
 LERC/Gross, B.

NCC 3-58 Cleveland State University 4969
 Development of a laboratory prototype fiber optic sensing system
Period Obligations
 01/30/86-02/27/90 FY89: \$43,485 TOTAL: \$187,330
Prin. Invest. NASA Tech. Officer CASE Category
 Anthan, D. J. LERC/Baumbick, R. J. 45-Elec Engr

NCC 3-86 Cleveland State University 4977
 Modeling and analysis of the space station solar cell array electrical characteristics
Period Obligations
 06/01/87-10/14/88 FY89: TOTAL: \$60,274
Prin. Invest. NASA Tech. Officer CASE Category
 Smith, R. W. LERC/Sater, B. L. 45-Elec Engr
 Wayland, K.

NCC 3-61 Cleveland State University 4970
 Experimental capabilities in the microgravity materials science laboratory
Period Obligations
 03/31/86-10/09/88 FY89: TOTAL: \$92,723
Prin. Invest. NASA Tech. Officer CASE Category
 Kramerich, G. L. LERC/Glasgow, T. K. 47-Materials Engr

NCC 3-95 Cleveland State University 4978
 Cellular dendritic solidification of binary alloys in a positive thermal gradient
Period Obligations
 09/15/87-09/13/91 FY89: \$45,000 TOTAL: \$305,000
Prin. Invest. NASA Tech. Officer CASE Category
 Tewari, S. N. LERC/Gray, H. R. 47-Materials Engr
 Chopra, M. A.

NCC 3-63 Cleveland State University 4971
 Development of ceramic composites with enhanced reliability
Period Obligations
 06/15/86-12/04/89 FY89: \$131,425 TOTAL: \$353,659
Prin. Invest. NASA Tech. Officer CASE Category
 Andrist, A. H. LERC/Hurwitz, F. I. 43-Chem Engr

NCC 3-96 Cleveland State University 4979
 Effect of natural convection on solidification behavior of transparent salt single crystals
Period Obligations
 11/01/87-10/31/90 FY89: \$27,293 TOTAL: \$75,668
Prin. Invest. NASA Tech. Officer CASE Category
 Tewari, S. N. LERC/Glasgow, T. K. 47-Materials Engr

NASA'S UNIVERSITY PROGRAM
OHIO (Continued)

NCC 3-98	Cleveland State University	4980	Development of wide band optical sensors and high frequency electro optic multiplexers <i>Period</i> 11/10/87-11/09/88 <i>Prin. Invest.</i> Anthan, D.	<i>Obligations</i> FY89: \$60,000 NASA Tech. Officer LERC/Bahmbick, R. J.	TOTAL: \$16,596 <i>CASE Category</i> 45-Elec Engr
NCC 3-143	Cleveland State University	4988	Innovative solar concentrator concepts research <i>Period</i> 07/01/89-06/31/90 <i>Prin. Invest.</i> Pintz, A.	<i>Obligations</i> FY89: \$60,000 NASA Tech. Officer LERC/Mroz, T.	TOTAL: \$60,000 <i>CASE Category</i> 42-Astro Engr
NCC 3-100	Cleveland State University	4981	Image processing and analysis techniques for utilization in turbulence and combustion research <i>Period</i> 11/25/87-11/31/90 <i>Prin. Invest.</i> Ghorashi, B.	<i>Obligations</i> FY89: \$112,206 NASA Tech. Officer LERC/Marek, C. J.	TOTAL: \$212,206 <i>CASE Category</i> 46-Mech Engr
NCC 3-111	Cleveland State University	4982	Microstructural and temperature materials microchemical characterization of elevated <i>Period</i> 08/01/88-04/15/90 <i>Prin. Invest.</i> Tewari, S. N.	<i>Obligations</i> FY89: \$92,112 NASA Tech. Officer LERC/Miner, R. V. LERC/Hull, D. R.	TOTAL: \$152,112 <i>CASE Category</i> 41-Aero Engr
NCC 3-119	Cleveland State University	4983	Creep of refractory metal fibers and modelling of metal matrix composites <i>Period</i> 01/01/89-12/31/89 <i>Prin. Invest.</i> Tewari, S. N.	<i>Obligations</i> FY89: \$81,131 NASA Tech. Officer LERC/Titran, R. H. LERC/Grobstein, T. L.	TOTAL: \$81,131 <i>CASE Category</i> 47-Materials Engr
NCC 3-121	Cleveland State University	4984	Electrical characterization of silicon carbide <i>Period</i> 11/18/88-11/17/89 <i>Prin. Invest.</i> Goradia, M. G.	<i>Obligations</i> FY89: \$17,379 NASA Tech. Officer LERC/Matus, L. G.	TOTAL: \$17,379 <i>CASE Category</i> 45-Elec Engr
NCC 3-122	Cleveland State University	4985	Analytical methods for materials analysis <i>Period</i> 12/01/88-11/30/89 <i>Prin. Invest.</i> Megargle, R. G. Towns, R. L.	<i>Obligations</i> FY89: \$86,668 NASA Tech. Officer LERC/Davies, R. L. LERC/Crandall, K. S.	TOTAL: \$86,668 <i>CASE Category</i> 12-Chemistry
NCC 3-138	Cleveland State University	4986	High temperature mechanical behavior of ceramic matrix composites <i>Period</i> 04/10/89-04/09/93 <i>Prin. Invest.</i> Hemann, J. H.	<i>Obligations</i> FY89: \$213,279 NASA Tech. Officer LERC/Levine, S. R. LERC/Salem, J. A.	TOTAL: \$213,279 <i>CASE Category</i> 47-Materials Engr
NCC 3-142	Cleveland State University	4987	Interaction between convection and heat transfer in crystal growth <i>Period</i> 10/01/89-07/31/90 <i>Prin. Invest.</i> Tewari, S. N.	<i>Obligations</i> FY89: \$90,000 NASA Tech. Officer LERC/Glasgow, T. K. LERC/Rosenthal, B. N.	TOTAL: \$90,000 <i>CASE Category</i> 47-Materials Engr
NGT 00-070-073	Cleveland State University	4989	Graduate student researchers underrepresented minority focus program <i>Period</i> 03/28/88-03/27/89 <i>Prin. Invest.</i> Kramerich, G. L.	<i>Obligations</i> FY89: \$18,000 NASA Tech. Officer HQ-XE/Owens, F. C.	TOTAL: \$18,000 <i>CASE Category</i> 21-Mathematics
NGT 00-070-083	Cleveland State University	4990	NASA graduate student researchers program <i>Period</i> 04/01/88-03/31/89 <i>Prin. Invest.</i> Anthan, D.	<i>Obligations</i> FY89: \$18,000 NASA Tech. Officer HQ-XE/Owens, F. C.	TOTAL: \$18,000 <i>CASE Category</i> 22-Computer Science
NGT 00-070-148	Cleveland State University	4991	Graduate student researchers underrepresented minority focus program <i>Period</i> 07/01/89-06/30/90 <i>Prin. Invest.</i> Ghorashi, B.	<i>Obligations</i> FY89: \$18,000 NASA Tech. Officer HQ-XE/Owens, F. C.	TOTAL: \$18,000 <i>CASE Category</i> 49-Engr, NEC
NAG 3-313	Cuyahoga Community College	4992	Pre-engineering program <i>Period</i> 09/01/82-08/31/90 <i>Prin. Invest.</i> Niro, L. Rivera, E. T.	<i>Obligations</i> FY89: \$28,000 NASA Tech. Officer LERC/Lawrence, R. F.	TOTAL: \$172,629 <i>CASE Category</i> 49-Engr, NEC
NAG 3-571	John Carroll University	4993	Optical sensors for use in propulsion systems <i>Period</i> 10/01/84-02/23/90 <i>Prin. Invest.</i> Fritsch, K.	<i>Obligations</i> FY89: \$54,250 NASA Tech. Officer LERC/Baumback, R. J.	TOTAL: \$235,350 <i>CASE Category</i> 45-Elec Engr
NAG 3-984	John Carroll University	4994	Development work on fiberoptic sensors <i>Period</i> 02/01/89-01/11/90 <i>Prin. Invest.</i> Carome, E. J. Ehstace, J.	<i>Obligations</i> FY89: \$46,200 NASA Tech. Officer LERC/Bahmbick, R. J. LERC/Seng, G.	TOTAL: \$46,200 <i>CASE Category</i> 13-Physics
NAG 3-946	Kent State University	4995	Development of secondary ion mass spectrometer system <i>Period</i> 10/01/88-10/31/89 <i>Prin. Invest.</i> Aburto, C. V.	<i>Obligations</i> FY89: \$56,960 NASA Tech. Officer LERC/Bailey, S. G.	TOTAL: \$56,960 <i>CASE Category</i> 13-Physics

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NAG 3-1030 Kent State University 4996
Physics of high temperature superconducting materials and their use in space applications
Period Obligations
04/05/89-04/04/90 FY89: \$128,000 TOTAL: \$128,000
Prin. Invest. NASA Tech. Officer CASE Category
Johnson, D. L. LERC/Aron, P. R. 13-Physics
Allender, D. W.
Kumar, S.

NAGW 368 Kenyon College 4997
Regulation of differential growth in root gravitropism
Period Obligations
09/01/82-05/31/89 FY89: TOTAL: \$185,744
Prin. Invest. NASA Tech. Officer CASE Category
Edwards, K. L. HQ-EB/Halstead, T. W. 51-Biological Sci

NAG 3-847 Miami University 4998
Properties of high TC superconductors through hyperfine interactions
Period Obligations
12/01/87-11/30/89 FY89: TOTAL: \$24,095
Prin. Invest. NASA Tech. Officer CASE Category
Julian, G. M. LERC/Leonard, R. F. 13-Physics
Jha, S.
Dunlap, R. A.

NAG 3-1053 Miami University 4999
Ni H2 cell separator matrix engineering
Period Obligations
06/05/89-06/04/90 FY89: \$45,137 TOTAL: \$45,137
Prin. Invest. NASA Tech. Officer CASE Category
Scott, W. E. LERC/Gahn, R. F. 49-Engr, NEC

NAS 9-17413 Miami University 5000
Research on mechanisms of space motion sickness
Period Obligations
05/01/85-02/01/90 FY89: \$40,000 TOTAL: \$380,456
Prin. Invest. NASA Tech. Officer CASE Category
Parker, D. E. JSC/Kutyna, F. 51-Biological Sci

NCC 1-113 Miami University 5001
Basic research on laser-beam-combining technology
Period Obligations
04/10/87-10/09/89 FY89: \$67,881 TOTAL: \$118,758
Prin. Invest. NASA Tech. Officer CASE Category
Wells, W. LARC/Meador, W. E. 13-Physics
LARC/Lee, J. H.

NGT 00-050-427 Miami University 5002
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Parker, D. E. HQ-XE/Owens, F. C. 61-Biol Aspects

NGT 00-070-097 Miami University 5003
Graduate student researchers underrepresented minority focus program
Period Obligations
08/24/88-08/23/89 FY89: TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Wells, W. HQ-XE/Owens, F. C. 13-Physics

NAG 3-885 Oberlin College 5004
High temperature superconducting films on insulating substrates
Period Obligations
03/15/88-03/14/90 FY89: \$25,000 TOTAL: \$75,000
Prin. Invest. NASA Tech. Officer CASE Category
Scofield, J. H. LERC/Alterovitz, S. 13-Physics

NAG 1-641 Ohio State University 5005
An experimental study of the effect of pitch rate on delta wing aerodynamics and stability
Period Obligations
04/01/86-06/30/88 FY89: TOTAL: \$99,998
Prin. Invest. NASA Tech. Officer CASE Category
Bragg, M. B. LARC/Brandon, J. M. 41-Aero Engr
Gregorek, G. M. LARC/Harvey, W. D.
Hoffman, M.

NAG 1-720 Ohio State University 5006
Decentralized control and identification experiments for the NASA LaRC Scone program
Period Obligations
01/01/87-09/30/90 FY89: \$64,868 TOTAL: \$167,113
Prin. Invest. NASA Tech. Officer CASE Category
Ozguner, U. LARC/Montgomery, R. C. 42-Astro Engr
Yurkovich, S. LARC/Welch, S.
Ossman, K.

NAG 1-988 Ohio State University 5007
Plate vibrations a summary of useful results
Period Obligations
05/01/89-04/30/90 FY89: \$20,000 TOTAL: \$20,000
Prin. Invest. NASA Tech. Officer CASE Category
Leissa, A. W. LARC/Perez, S. E. 46-Mech Engr

NAG 1-1058 Ohio State University 5008
General simulation of helicopters and interface to antenna pattern prediction codes
Period Obligations
10/01/89-06/30/90 FY89: \$149,776 TOTAL: \$149,776
Prin. Invest. NASA Tech. Officer CASE Category
Newman, E. H. LARC/Barber, G. C. 45-Elec Engr
Rojas, R. G. LARC/Gilreath, M. C.
Burnside, W. D.

NAG 2-195 Ohio State University 5009
Discrete control modelling of computer-aided control of strongly interactive systems
Period Obligations
08/01/82-12/31/88 FY89: TOTAL: \$445,648
Prin. Invest. NASA Tech. Officer CASE Category
Miller, R. A. ARC/Hartzell, E. J. 69-Psych, NEC
Jagacinski, R. J.

NAG 2-542 Ohio State University 5010
Target signature modeling and bistatic scattering measurement studies
Period Obligations
09/01/88-08/31/90 FY89: \$139,750 TOTAL: \$247,611
Prin. Invest. NASA Tech. Officer CASE Category
Burnside, W. D. ARC/Woo, A. C. 45-Elec Engr
Marhefka, R. J. ARC/Schuh, M. J.
Gupta, I. J.

NASA'S UNIVERSITY PROGRAM
OHIO (Continued)

NAG 3-28	Ohio State University	5011	Effects of ice formation on 2D aerodynamic shapes <i>Period</i> 02/01/80-11/01/89 <i>Prin. Invest.</i> Bragg, M. B.	<i>Obligations</i> FY89: \$99,999 NASA Tech. Officer LERC/Potapczuk, M. G. LERC/Shaw, R.	TOTAL: \$842,953 <i>CASE Category</i> 41-Aero Engr
NAG 3-764	Ohio State University	5019	Organized structures in a supersonic shear layer <i>Period</i> 12/01/86-02/27/90 <i>Prin. Invest.</i> Samimy, M.	<i>Obligations</i> FY89: \$30,000 NASA Tech. Officer LERC/Zaman, K. Q. LERC/Marek, C. J.	TOTAL: \$107,006 <i>CASE Category</i> 46-Mech Engr
NAG 3-159	Ohio State University	5012	Engineering calculations for communications satellite systems planning <i>Period</i> 01/20/81-12/31/89 <i>Prin. Invest.</i> Reilly, C. H. Walton, E. K.	<i>Obligations</i> FY89: \$96,239 NASA Tech. Officer LERC/Heyward, A. LERC/Miller, E. F.	TOTAL: \$871,905 <i>CASE Category</i> 45-Elec Engr
NAG 3-773	Ohio State University	5020	Modeling of gear dynamics housing noise and transmissibility of a NASA spur gear test facility <i>Period</i> 01/10/87-01/09/90 <i>Prin. Invest.</i> Houser, D. R. Singh, R.	<i>Obligations</i> FY89: \$69,655 NASA Tech. Officer LERC/Zakrajsek, J. J.	TOTAL: \$197,980 <i>CASE Category</i> 46-Mech Engr
NAG 3-374	Ohio State University	5013	Documentation office shapes for the helicopter icing flight test program <i>Period</i> 11/29/82-11/28/89 <i>Prin. Invest.</i> Lee, J. D.	<i>Obligations</i> FY89: \$10,000 NASA Tech. Officer LERC/Potapczuk, M. G. LERC/Reinmann, J. J.	TOTAL: \$418,899 <i>CASE Category</i> 41-Aero Engr
NAG 3-784	Ohio State University	5021	Measurement of the properties of lossy materials inside a finite conducting cylinder <i>Period</i> 02/20/87-09/30/88 <i>Prin. Invest.</i> Peters, L. Dominek, A. K.	<i>Obligations</i> FY89: NASA Tech. Officer LERC/Stearns, C. A. LERC/Behrendt, D. R.	TOTAL: \$174,835 <i>CASE Category</i> 49-Engr, NEC
NAG 3-476	Ohio State University	5014	Analysis of electromagnetic scattering <i>Period</i> 09/25/83-01/31/90 <i>Prin. Invest.</i> Pathak, P. H. Chuang, C.	<i>Obligations</i> FY89: \$74,786 NASA Tech. Officer LERC/Rice, E. J.	TOTAL: \$388,445 <i>CASE Category</i> 45-Elec Engr
NAG 3-790	Ohio State University	5022	Formulation of special transition finite elements <i>Period</i> 04/13/87-05/08/90 <i>Prin. Invest.</i> Sarigul, N.	<i>Obligations</i> FY89: \$55,000 NASA Tech. Officer LERC/Chamis, C. C. LERC/Caruso, J. J.	TOTAL: \$167,676 <i>CASE Category</i> 41-Aero Engr
NAG 3-536	Ohio State University	5015	Adaptive arrays for satellite communications <i>Period</i> 03/13/84-02/28/90 <i>Prin. Invest.</i> Gupta, I. J. Walton, E. K.	<i>Obligations</i> FY89: \$79,999 NASA Tech. Officer LERC/Arth, C. H. LERC/Miller, E. F.	TOTAL: \$468,530 <i>CASE Category</i> 45-Elec Engr
NAG 3-824	Ohio State University	5023	Crystallization of the glassy grain boundary phase in silicon nitride ceramics <i>Period</i> 10/15/87-10/01/89 <i>Prin. Invest.</i> Drummond, C. H. Lee, W. E.	<i>Obligations</i> FY89: \$68,004 NASA Tech. Officer LERC/Sanders, W. A. LERC/Kiser, J. D.	TOTAL: \$130,601 <i>CASE Category</i> 47-Materials Engr
NAG 3-706	Ohio State University	5016	Experimental study of shock-boundary layer interactions in hypersonic flow <i>Period</i> 03/01/86-12/31/90 <i>Prin. Invest.</i> Lee, J. D. Gregorek, G. M. Scott, J. N.	<i>Obligations</i> FY89: \$165,056 NASA Tech. Officer LERC/Sagerser, D. P. LERC/Coltrin, R. E.	TOTAL: \$412,412 <i>CASE Category</i> 49-Engr, NEC
NAG 3-843	Ohio State University	5024	Effects of magnetic nozzle configurations on plasma thrusters <i>Period</i> 12/05/87-01/01/90 <i>Prin. Invest.</i> York, T. M. Emmer, D. S.	<i>Obligations</i> FY89: \$75,000 NASA Tech. Officer LERC/Mantenieks, M. A.	TOTAL: \$149,999 <i>CASE Category</i> 13-Physics
NAG 3-743	Ohio State University	5017	Interaction between Tollmien Schlichting waves and free stream disturbances in boundary layer flows <i>Period</i> 10/01/86-05/31/89 <i>Prin. Invest.</i> Bodonyi, R. J.	<i>Obligations</i> FY89: NASA Tech. Officer LERC/Goldstein, M. E.	TOTAL: \$164,903 <i>CASE Category</i> 41-Aero Engr
NAG 3-880	Ohio State University	5025	Plate vibrations a summary of useful results <i>Period</i> 03/01/88-03/31/90 <i>Prin. Invest.</i> Leissa, A. W.	<i>Obligations</i> FY89: \$59,400 NASA Tech. Officer LERC/Lawrence, C.	TOTAL: \$79,400 <i>CASE Category</i> 46-Mech Engr
NAG 3-755	Ohio State University	5018	Powder agglomeration in microgravity experiment <i>Period</i> 11/25/86-03/23/90 <i>Prin. Invest.</i> Cawley, J. D.	<i>Obligations</i> FY89: \$69,571 NASA Tech. Officer LERC/Fox, D. S.	TOTAL: \$208,077 <i>CASE Category</i> 49-Engr, NEC
NAG 3-913	Ohio State University	5026	Electromagnetic properties of ice coated surfaces <i>Period</i> 06/15/88-10/31/89 <i>Prin. Invest.</i> Peters, L. Burndide, D.	<i>Obligations</i> FY89: \$56,465 NASA Tech. Officer LERC/Shaw, R. J. LERC/Burstadt, P. L.	TOTAL: \$281,069 <i>CASE Category</i> 45-Elec Engr

NASA'S UNIVERSITY PROGRAM

OHIO (Continued)

NAG 3-930 **Ohio State University** **5027**
 Evaluation of coatings and lubricants service lives of die casting dies
Period *Obligations*
 10/01/88-05/30/91 FY89: \$100,000 TOTAL: \$139,930
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Altan, T. LERC/Schwartz, H. J. 47-Materials Engr
 Chen, O. LERC/Krysiak, J.
 Shivpuri, R.

NAG 3-1039 **Ohio State University** **5035**
 Low velocity vector full field visual velocimeter for crystallization experiments
Period *Obligations*
 04/14/89-04/13/90 FY89: \$24,096 TOTAL: \$24,096
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Brodkey, R. S. LERC/Meyer, M. B. 46-Mech Engr

NAG 3-942 **Ohio State University** **5028**
 Microstructural characterization of intermetallic matrix ceramic particulate composites
Period *Obligations*
 10/01/88-10/01/89 FY89: \$44,483 TOTAL: \$44,483
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Lee, W. E. LERC/Draper, S. L. 47-Materials Engr
 Drory, M. D.

NAG 3-1058 **Ohio State University** **5036**
 Jet noise production and radiation
Period *Obligations*
 06/29/89-10/15/90 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Scott, J. N. LERC/Krejsa, E. A. 41-Aero Engr
 Bodonyi, R. J. LERC/Groeneweg, J. F.

NAG 3-981 **Ohio State University** **5029**
 Measurement of em scattering
Period *Obligations*
 01/01/89-10/01/89 FY89: \$70,136 TOTAL: \$70,136
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Pathak, P. H. LERC/Rice, E. J. 45-Elec Engr

NAG 5-768 **Ohio State University** **5037**
 Comparison of high speed resolution atlas of integrated sunlight and the solar luminosity from five epochs
Period *Obligations*
 04/15/86-06/14/88 FY89: TOTAL: \$24,439
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Mitchell, W. E., Jr. GSFC/Bullock, G. D. 19-Phys Sci, NEC

NAG 3-985 **Ohio State University** **5030**
 Penetration of jets into a turbulent supersonic airstream
Period *Obligations*
 02/20/89-02/19/90 FY89: \$64,709 TOTAL: \$64,709
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Lee, J. D. LERC/Lezberg, E. A. 41-Aero Engr

NAG 5-781 **Ohio State University** **5038**
 Terrestrial gravity data analysis for interim gravity model improvement
Period *Obligations*
 06/30/86-10/31/89 FY89: TOTAL: \$137,922
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Rapp, R. H. GSFC/Marsh, J. G. 13-Physics

NAG 3-986 **Ohio State University** **5031**
 The supersonic throughflow turbofan
Period *Obligations*
 02/20/89-02/19/90 FY89: \$135,000 TOTAL: \$135,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Lee, J. D. LERC/Coltrin, R. E. 41-Aero Engr
 Bragg, M. B.

NAG 5-1027 **Ohio State University** **5039**
 Ultraviolet spectroscopy of planetary nebulae cosmological implications
Period *Obligations*
 12/15/87-12/14/89 FY89: \$15,444 TOTAL: \$26,044
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Ferland, G. J. GSFC/Kondo, Y. 11-Astronomy
 Capriotti, E. R.
 Peterson, B. M.

NAG 3-999 **Ohio State University** **5032**
 The surface properties of liquid semiconductors and metals
Period *Obligations*
 03/01/89-02/28/90 FY89: \$75,000 TOTAL: \$75,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Stroud, D. G. LERC/Wilkinson, R. A. 13-Physics

NAG 8-483 **Ohio State University** **5040**
 Theoretical studies of the surface tension of liquid metal systems
Period *Obligations*
 07/01/84-12/31/87 FY89: TOTAL: \$163,991
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Stroud, D. G. MSFC/Yates, I. C. 47-Materials Engr

NAG 3-1000 **Ohio State University** **5033**
 Constitutive parameter measurements
Period *Obligations*
 02/01/89-01/31/90 FY89: \$149,228 TOTAL: \$149,228
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Dominek, A. K. LERC/Stearns, C. A. 49-Engr, NEC
 LERC/Behrendt, D. R.

NAGW 297 **Ohio State University** **5041**
 Interaction of calcium, calmodulin and auxin in root gravitropism
Period *Obligations*
 03/01/82-02/28/90 FY89: TOTAL: \$343,532
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Evans, M. E. HQ-EB/Halstead, T. W. 51-Biological Sci

NAG 3-1035 **Ohio State University** **5034**
 Numerical investigation of jet mixing enhancement by single and multiple frequency
Period *Obligations*
 05/01/89-04/30/90 FY89: \$15,000 TOTAL: \$15,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Scott, J. N. LERC/Zaman, K. B. 41-Aero Engr
 LERC/Rice, E. J.

NAGW 625 **Ohio State University** **5042**
 The role of gravity in apical dominance
Period *Obligations*
 04/01/84-10/31/89 FY89: TOTAL: \$138,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Cline, M. HQ-EB/Halstead, T. W. 51-Biological Sci

NASA'S UNIVERSITY PROGRAM **OHIO (Continued)**

NAGW 750	Ohio State University		5043	NCA 2-154	Ohio State University		5051
	Search for extraterrestrial life research (SETI)		Intensity and broadening coefficients of selected CO2 lines in the infrared		<i>Obligations</i>		
	<i>Period</i>		<i>Period</i>				
	05/01/85-03/31/90	FY89: \$15,000	TOTAL: \$71,334			10/01/86-12/31/88	FY89:
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
Kraus, J. D.	HQ-EB/Fogleman, S. W.	99-Multi-Discip	Rao, K. N.	ARC/Chackerian, C.	13-Physics		
Dixon, R. S.	HQ-EB/Rummel, J. D.		Guelachvili, G.				
			Huet, T.				
NAGW 780	Ohio State University		5044	NCA 2-288	Ohio State University		5052
	Cellular polarity and interactions in plant graviperception		Enroute flight path planning cooperative performance of flight crews and knowledge based systems		<i>Obligations</i>		
	<i>Period</i>		<i>Period</i>				
	07/15/85-12/14/89	FY89: \$45,000	TOTAL: \$205,000			02/01/88-03/31/89	FY89: \$6,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
Sack, F. D.	HQ-EB/Halstead, T. W.	54-Env Biology	Smith, P. J.	ARC/Norman, S. D.	49-Engr, NEC		
			McCoy, C. E.	ARC/Chappell, S. L.			
NAGW 901	Ohio State University		5045	NCA 2-298	Ohio State University		5053
	Effectives of hypergravity and hypogravity environments on cell cycle regulation during fern spore generation		Computational study of the jet in ground effect flow with dynamically adaptive grid		<i>Obligations</i>		
	<i>Period</i>		<i>Period</i>				
	06/15/86-12/31/89	FY89:	TOTAL: \$90,000			03/21/88-03/20/90	FY89: \$26,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
Raghavan, V.	HQ-EB/Halstead, T. W.	55-Agriculture Sci	Nakamura, S.	ARC/Van Dalsem, W. P.	46-Mech Engr		
NAGW 973	Ohio State University		5046	NCA 2-322	Ohio State University		5054
	Establish a center for the commercial development of space		Radar cross section computation of arbitrarily shaped cavities		<i>Obligations</i>		
	<i>Period</i>		<i>Period</i>				
	09/01/86-05/31/89	FY89: \$1,275,000	TOTAL: \$3,010,000			06/21/88-06/20/90	FY89: \$39,988
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
Bossler, J.	HQ-IG/Oran, W. A.	41-Aero Engr	Chou, R. C.	ARC/Woo, A. C.	45-Elec Engr		
Anderson, W.	HQ/Whitten, R. P.			ARC/Enomoto, F.			
NAGW 1060	Ohio State University		5047	NCA 2-351	Ohio State University		5055
	Research and training in hypersonics		Cognitive engineering in aerospace the alarm problem		<i>Obligations</i>		
	<i>Period</i>		<i>Period</i>				
	03/15/87-05/31/90	FY89: \$400,000	TOTAL: \$599,836			09/01/88-12/01/89	FY89:
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
Petrie, S. L.	HQ-RF/Wander, S. M.	19-Phys Sci, NEC	Woods, D. D.	ARC/Shaflo, M.	49-Engr, NEC		
Gregorek, G. M.	HQ-RF/Graves, R. A.		Smith, P. J.	ARC/Palmer, E. A.			
NAGW 1129	Ohio State University		5048	NCA 2-379	Ohio State University		5056
	Analysis of atmos occulation spectra		Ch3c1 feature in the atmos spectra		<i>Obligations</i>		
	<i>Period</i>		<i>Period</i>				
	07/01/87-12/31/88	FY89:	TOTAL: \$35,384			01/01/89-12/31/90	FY89: \$18,753
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
Shaw, J. H.	HQ-EE/Kurylo, M. J.	31-Atmos Sci	Rao, K. N.	ARC/Chackerian, C., Jr.	13-Physics		
	HQ-EE/Margitan, J. J.		Lacome, N.				
NAS 1-17450	Ohio State University		5049	NCC 2-592	Ohio State University		5057
	Analysis of large aperture reflector antennas		Cognitive engineering in aerospace applications		<i>Obligations</i>		
	<i>Period</i>		<i>Period</i>				
	07/18/83-08/31/91	FY89: \$78,091	TOTAL: \$287,701			04/01/89-03/31/90	FY89: \$188,244
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
Rudduck, C.	LARC/Beck, F. B.	45-Elec Engr	Woods, D. D.	ARC/Palmer, E. A.	41-Aero Engr		
	LARC/Bailey, M. C.			ARC/Shaflo, M. G.			
NAS 8-35595	Ohio State University		5050	NCC 2-615	Ohio State University		5058
	Development of a coaxial viewing and vision system for gas tungsten arc welding		Enroute flight path planning cooperative performance of flight crews and knowledge based systems		<i>Obligations</i>		
	<i>Period</i>		<i>Period</i>				
	12/01/83-09/30/88	FY89:	TOTAL: \$423,537			07/01/89-06/30/90	FY89: \$82,998
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>		
Richardson, R. W.	MSFC/Jones, C. S.	49-Engr, NEC	Smith, P. J.	ARC/Palmer, E. A.	69-Psych, NEC		
	MSFC/Kurqon, C.						

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OHIO (Continued)

NCC 3-105	Ohio State University		5059
	Multi layer film deposition for high t super conductors		
	<i>Period</i>	<i>Obligations</i>	
	01/30/88-01/28/90	FY89: \$55,980	
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	
Valco, G. J.	LERC/Bhasin, K. B.	<i>CASE Category</i>	TOTAL: \$105,949
	LERC/Leonard, R. F.	45-Elec Engr	
NCC 3-145	Ohio State University		5060
	NASA lears research center compact range design		
	<i>Period</i>	<i>Obligations</i>	
	08/20/89-08/09/90	FY89: \$49,986	
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	
Burnside, W. D.	LERC/Kunath, R. R.	<i>CASE Category</i>	TOTAL: \$49,986
Gupta, I. J.		45-Elec Engr	
NGR 36-008-161	Ohio State University		5061
	The direct combination of satellite and gravity data		
	<i>Period</i>	<i>Obligations</i>	
	05/01/71-12/31/89	FY89:	
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	
Rapp, R. H.	GSFC/Welker, J.	<i>CASE Category</i>	TOTAL: \$665,571
		32-Geological Sci	
NGT 00-050-078	Ohio State University		5062
	NASA graduate student researchers program		
	<i>Period</i>	<i>Obligations</i>	
	10/01/86-09/30/89	FY89: \$18,001	
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	
Smith, P.	HQ-LE/Owens, F. C.	<i>CASE Category</i>	TOTAL: \$53,993
		22-Computer Science	
NGT 00-050-259	Ohio State University		5063
	NASA graduate student researchers program		
	<i>Period</i>	<i>Obligations</i>	
	08/01/88-07/31/90	FY89: \$18,000	
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	
Herbert, T.	HQ-XE/Owens, F. C.	<i>CASE Category</i>	TOTAL: \$36,000
		46-Mech Engr	
NGT 00-050-378	Ohio State University		5064
	NASA graduate student researchers program		
	<i>Period</i>	<i>Obligations</i>	
	10/01/88-09/30/89	FY89: \$17,100	
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	
Valco, G. J.	HQ-XE/Owens, F. C.	<i>CASE Category</i>	TOTAL: \$17,100
		45-Elec Engr	
NGT 00-050-409	Ohio State University		5065
	NASA graduate student researchers program		
	<i>Period</i>	<i>Obligations</i>	
	08/01/89-07/31/90	FY89: \$18,000	
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	
Ozguner, U.	HQ-XE/Owens, F. C.	<i>CASE Category</i>	TOTAL: \$18,000
		45-Elec Engr	
NGT 36-020-800	Ohio State University		5066
	NASA graduate student researchers program		
	<i>Period</i>	<i>Obligations</i>	
	06/01/85-05/31/88	FY89:	
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	
Evans, M. L.	HQ-LE/Owens, F. C.	<i>CASE Category</i>	TOTAL: \$48,143
		51-Biological Sci	
NSG 1498	Ohio State University		5067
	Analysis of airborne antenna patterns		
	<i>Period</i>	<i>Obligations</i>	
	01/16/78-08/31/90	FY89: \$134,730	
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	
Burnside, W. D.	LARC/Gilreath, M. C.	<i>CASE Category</i>	TOTAL: \$947,958
Rojas, R. G.	LARC/Cockrell, C. R.	45-Elec Engr	
NSG 1613	Ohio State University		5068
	Compact range and radar cross section studies		
	<i>Period</i>	<i>Obligations</i>	
	05/01/79-01/31/90	FY89: \$746,560	
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	
Burnside, W. D.	LARC/Gilreath, M. C.	<i>CASE Category</i>	TOTAL: \$4,469,254
Peters, L., Jr.	LARC/Sawyer, W. C.	45-Elec Engr	
Dominek, A. K.			
NSG 5265	Ohio State University		5069
	Basic research for the Earth dynamics program		
	<i>Period</i>	<i>Obligations</i>	
	04/01/78-07/31/90	FY89: \$45,000	
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	
Mueller, I. I.	GSFC/Frey, H. V.	<i>CASE Category</i>	TOTAL: \$718,721
Goad, C.	GSFC/Smith, D. E.	32-Geological Sci	
NAG 1-816	Ohio University		5070
	Independent assessment of the Loran C performance assurance system		
	<i>Period</i>	<i>Obligations</i>	
	09/14/87-09/30/90	FY89: \$94,000	
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	
Lilley, R. W.	LARC/Morrell, F. R.	<i>CASE Category</i>	TOTAL: \$190,998
		41-Aero Engr	
NAG 1-940	Ohio University		5071
	Efficacy and reliability of bioelectrical computer stimulus with application to air traffic control		
	<i>Period</i>	<i>Obligations</i>	
	12/08/88-12/07/89	FY89: \$40,000	
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	
Hill, H. W.	LARC/Howell, W. E.	<i>CASE Category</i>	TOTAL: \$40,000
		22-Computer Science	
NAG 3-762	Ohio University		5072
	Multi frontal parallel solution method in vibration analysis of finite elements models		
	<i>Period</i>	<i>Obligations</i>	
	01/01/87-12/31/88	FY89:	
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	
Akl, F. A.	LERC/Kiraly, L. J.	<i>CASE Category</i>	TOTAL: \$39,930
		46-Mech Engr	
NAG 3-902	Ohio University		5073
	Parallel solution for the dynamic response of finite element models		
	<i>Period</i>	<i>Obligations</i>	
	09/15/88-09/14/90	FY89:	
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	
Akl, F. A.	LERC/Kiraly, L. J.	<i>CASE Category</i>	TOTAL: \$40,000
Chesnut, T. L.		44-Civil Engr	
NAG 3-970	Ohio University		5074
	Experimental analysis of impact damping on the forced transverse vibration of shafts		
	<i>Period</i>	<i>Obligations</i>	
	01/01/89-12/31/89	FY89: \$20,000	
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	
Akl, F. A.	LERC/Brown, G. V.	<i>CASE Category</i>	TOTAL: \$20,000
		46-Mech Engr	
NGR 36-009-017	Ohio University		5075
	Joint university program in air transportation systems		
	<i>Period</i>	<i>Obligations</i>	
	02/26/71-01/31/92	FY89: \$113,798	
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	
McFarland, R. H.	LARC/Morrell, F. R.	<i>CASE Category</i>	TOTAL: \$1,574,555
	LARC/Bryant, W. H.	45-Elec Engr	

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NGT 00-050-525 NASA graduate student researchers program <i>Period</i> 09/11/89-09/10/90 <i>Prin. Invest.</i> Mitchell, J. R.	Ohio University <i>Obligations</i> FY89: \$17,990 NASA Tech. Officer HQ-XE/Owens, F. C.	5076 TOTAL: \$17,990 CASE Category 45-Elec Engr
NAG 1-444 Solution algorithms for steady and transient rolling contact <i>Period</i> 09/01/84-09/30/90 <i>Prin. Invest.</i> Padovan, J.	University of Akron <i>Obligations</i> FY89: NASA Tech. Officer LARC/Tanner, J. A. LARC/Lopez, M. C.	5077 TOTAL: \$166,526 CASE Category 29-Math/Computer, NEC
NAG 1-448 Studies and characterization of processable polyimides with enhanced thermal stability and thermosetting polyimides <i>Period</i> 02/07/84-03/31/90 <i>Prin. Invest.</i> Harris, F. W.	University of Akron <i>Obligations</i> FY89: \$99,935 NASA Tech. Officer LARC/Hergenrother, P. M. LARC/Jensen, B. J.	5078 TOTAL: \$390,599 CASE Category 12-Chemistry
NAG 1-779 High performance thermoplastic composites <i>Period</i> 06/10/87-03/15/90 <i>Prin. Invest.</i> Kelley, F. N. Meinecke, E. A. Harris, F. W.	University of Akron <i>Obligations</i> FY89: \$195,332 NASA Tech. Officer LARC/Baucom, R. M. LARC/Johnston, N. J.	5079 TOTAL: \$295,332 CASE Category 49-Engr, NEC
NAG 3-50 NASA LERC/Akron University graduate cooperative fellowship programs <i>Period</i> 06/01/80-04/03/90 <i>Prin. Invest.</i> Fertis, D. G. Chang, T. P. Robinson, D. N.	University of Akron <i>Obligations</i> FY89: \$25,200 NASA Tech. Officer LERC/Chamis, C. C. LERC/Johns, R. H.	5080 TOTAL: \$115,325 CASE Category 41-Aero Engr
NAG 3-54 Self adaptive solutions strategies <i>Period</i> 08/01/80-06/30/88 <i>Prin. Invest.</i> Padovan, J.	University of Akron <i>Obligations</i> FY89: NASA Tech. Officer LERC/Chamis, C. C. LERC/Hirschbein, M. S.	5081 TOTAL: \$190,367 CASE Category 46-Mech Engr
NAG 3-55 Helicopter transmission reliability model <i>Period</i> 08/01/80-08/31/88 <i>Prin. Invest.</i> Savage, M.	University of Akron <i>Obligations</i> FY89: NASA Tech. Officer LERC/Lewicki, D. G.	5082 TOTAL: \$352,630 CASE Category 46-Mech Engr
NAG 3-379 Multiaxial structural behavior of high temperature materials <i>Period</i> 12/15/82-03/09/90 <i>Prin. Invest.</i> Robinson, D. N. Ellis, J. R.	University of Akron <i>Obligations</i> FY89: \$52,400 NASA Tech. Officer LERC/Arnold, S. M.	5083 TOTAL: \$750,442 CASE Category 41-Aero Engr
NAG 3-479 Mathematical and experimental modeling of impact ice dispersion mechanisms <i>Period</i> 10/30/83-03/07/90 <i>Prin. Invest.</i> Scavuzzo, R. J. Chu, M. L.	University of Akron <i>Obligations</i> FY89: \$65,000 NASA Tech. Officer LERC/Olsen, W.	5084 TOTAL: \$316,602 CASE Category 41-Aero Engr
NAG 3-531 Numerical study of flow in the disk-stator cavity of a gas turbine <i>Period</i> 06/01/84-07/31/89 <i>Prin. Invest.</i> Drummond, J. E.	University of Akron <i>Obligations</i> FY89: NASA Tech. Officer LERC/De Anva, R. G.	5085 TOTAL: \$97,568 CASE Category 41-Aero Engr
NAG 3-637 Exp study of the plume characteristics of electrothermal thrusters <i>Period</i> 06/01/85-05/24/90 <i>Prin. Invest.</i> Serafini, J. S.	University of Akron <i>Obligations</i> FY89: NASA Tech. Officer LERC/Stone, J. R.	5086 TOTAL: \$154,527 CASE Category 49-Engr, NEC
NAG 3-664 Hierarchical parallel computer architectures defined by computational multidisciplinary mechanics <i>Period</i> 10/07/85-02/14/90 <i>Prin. Invest.</i> Padovan, J.	University of Akron <i>Obligations</i> FY89: \$70,000 NASA Tech. Officer LERC/Chamis, C. C. LERC/Hopkins, D. A.	5087 TOTAL: \$276,129 CASE Category 41-Aero Engr
NAG 3-675 Flow visualization methods for thin film technology <i>Period</i> 12/10/85-12/29/89 <i>Prin. Invest.</i> Braun, M. J. Batur, C.	University of Akron <i>Obligations</i> FY89: NASA Tech. Officer LERC/Proctor, M. P.	5088 TOTAL: \$207,419 CASE Category 49-Engr, NEC
NAG 3-778 Real time simulation methods for propulsion system dynamics <i>Period</i> 02/01/87-07/31/88 <i>Prin. Invest.</i> Hartley, T. T.	University of Akron <i>Obligations</i> FY89: NASA Tech. Officer LERC/Krosel, S. LERC/Lehtinen, B.	5089 TOTAL: \$47,963 CASE Category 41-Aero Engr
NAG 3-813 Scanning tunneling spectroscopy <i>Period</i> 07/25/87-01/30/89 <i>Prin. Invest.</i> Henriksen, P. N.	University of Akron <i>Obligations</i> FY89: NASA Tech. Officer LERC/Abel, P. B. LERC/Pepper, S. V.	5090 TOTAL: \$30,000 CASE Category 13-Physics
NAG 3-872 Symbolic derivation of constitutive material models and automatic code generation <i>Period</i> 02/01/88-01/31/89 <i>Prin. Invest.</i> Tan, H. Q.	University of Akron <i>Obligations</i> FY89: \$61,015 NASA Tech. Officer LERC/Arnold, S. M.	5091 TOTAL: \$104,347 CASE Category 41-Aero Engr

NASA'S UNIVERSITY PROGRAM
OHIO (Continued)

NAG 3-900 University of Akron 5092
 Vibration signature analysis of gear transmission and housing system
Period Obligations
 08/01/88-09/11/90 FY89: \$60,000 TOTAL: \$120,000
Prin. Invest. NASA Tech. Officer CASE Category
 Choy, F. K. LERC/Zakrajsek, J. J. 46-Mech Engr

NAG 3-901 University of Akron 5093
 Finite element implementation and computational techniques for constitutive modeling of high temperature composites
Period Obligations
 06/01/88-07/31/90 FY89: \$60,103 TOTAL: \$125,095
Prin. Invest. NASA Tech. Officer CASE Category
 Chang, T. P. LERC/Arnold, S. M. 41-Aero Engr
 Chang, T. Y.

NAG 3-904 University of Akron 5094
 Improved large perturbation propulsion models for control system design
Period Obligations
 05/15/88-05/14/90 FY89: \$55,291 TOTAL: \$110,021
Prin. Invest. NASA Tech. Officer CASE Category
 Hartley, T. T. LERC/Melcher, K. J. 41-Aero Engr
 LERC/Lorenzo, C. F.

NAG 3-906 University of Akron 5095
 Advanced optics for light scattering instrumentation
Period Obligations
 06/01/88-05/31/90 FY89: \$39,988 TOTAL: \$75,322
Prin. Invest. NASA Tech. Officer CASE Category
 Cheung, H. M. LERC/Glasgow, T. K. 13-Physics

NAG 3-923 University of Akron 5096
 Expert system diagnostic for 30/20 gigahertz
Period Obligations
 08/23/88-08/22/89 FY89: TOTAL: \$64,834
Prin. Invest. NASA Tech. Officer CASE Category
 Durkin, J. LERC/Petrik, E. J. 29-Math/Computer, NEC

NAG 3-969 University of Akron 5097
 Experimental and analytical study of brush seals
Period Obligations
 12/22/88-12/21/89 FY89: \$70,340 TOTAL: \$70,340
Prin. Invest. NASA Tech. Officer CASE Category
 Braun, M. J. LERC/Bobula, G. 46-Mech Engr
 LERC/Hendricks, R. C.

NAG 3-1031 University of Akron 5098
 Analysis of the Space Shuttle main engine simulation
Period Obligations
 05/01/89-12/31/89 FY89: \$40,031 TOTAL: \$40,031
Prin. Invest. NASA Tech. Officer CASE Category
 Garcia, J. A. LERC/Merrill, W. C. 41-Aero Engr

NAG 3-1047 University of Akron 5099
 Optimal spiral bevel transmission design
Period Obligations
 06/01/89-05/31/90 FY89: \$61,700 TOTAL: \$61,700
Prin. Invest. NASA Tech. Officer CASE Category
 Savage, M. LERC/Coe, H. H. 46-Mech Engr

NAG 3-1071 University of Akron 5100
 Further development of a numerical algorithm for modeling hydrodynamic and hydrostatic journal bearings
Period Obligations
 09/01/89-08/31/90 FY89: \$63,667 TOTAL: \$63,667
Prin. Invest. NASA Tech. Officer CASE Category
 Braun, M. J. LERC/Capaldi, R. J. 46-Mech Engr
 Choy, F. K.

NCC 3-93 University of Akron 5101
 Non invasive laser flow visualization and computer based digital imaging for flow quantification internal and external flow in large structures
Period Obligations
 09/01/87-08/31/90 FY89: \$21,983 TOTAL: \$52,023
Prin. Invest. NASA Tech. Officer CASE Category
 Braun, M. L. LERC/Russell, L. M. 46-Mech Engr
 Batur, C. LERC/Lopez, I.

NCC 3-102 University of Akron 5102
 Microstrip antenna arrays with parasitic elements
Period Obligations
 12/05/87-12/04/88 FY89: TOTAL: \$34,828
Prin. Invest. NASA Tech. Officer CASE Category
 Lee, K. F. LERC/Lee, R. Q. 45-Elec Engr

NCC 3-104 University of Akron 5103
 Support of microgravity materials science lab software and hardware development at NASA Lewis
Period Obligations
 12/20/87-12/31/89 FY89: \$146,112 TOTAL: \$267,657
Prin. Invest. NASA Tech. Officer CASE Category
 Young, G. W. LERC/Roberts, G. P. 47-Materials Engr
 Hariharan, S. I. LERC/Chait, A.

NCC 3-109 University of Akron 5104
 Temperature and melt solid interface control during crystal growth
Period Obligations
 05/15/88-11/14/89 FY89: TOTAL: \$41,382
Prin. Invest. NASA Tech. Officer CASE Category
 Batur, C. LERC/Rosenthal, B. N. 47-Materials Engr
 Braun, M. J. LERC/Glasgow, T. K.

NCC 3-146 University of Akron 5105
 Detection of reflector surface from near-field phase measurements
Period Obligations
 08/01/89-08/01/90 FY89: \$15,000 TOTAL: \$15,000
Prin. Invest. NASA Tech. Officer CASE Category
 Ida, N. LERC/Acosta, R. J. 45-Elec Engr

NCC 3-150 University of Akron 5106
 Adaptive control of interface by temperature and interface profile feedback in transparent multi-zone crystal growth furnace
Period Obligations
 09/25/89-09/24/90 FY89: \$18,357 TOTAL: \$18,357
Prin. Invest. NASA Tech. Officer CASE Category
 Batur, C. LERC/Rosenthal, B. N. 46-Mech Engr
 LERC/Glasgow, T. K.

NGT 00-070-015 University of Akron 5107
 NASA graduate student researchers program
Period Obligations
 01/01/87-12/31/89 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
 Harris, F. W. HQ-LE/Owens, F. C. 71-Anthropology

NASA'S UNIVERSITY PROGRAM
OHIO (Continued)

NAG 1-8	University of Cincinnati	5108	Spline collocation for viscous flow over-after body configurations
Period 11/01/79-12/31/88	FY89: NASA Tech. Officer	TOTAL: \$283,458 CASE Category	Obligations
Prin. Invest. Rubin, S. G.	LARC/Compton, W. B.	41-Aero Engr	
Khosla, P. K.	LARC/Henderson, W. P.		
NAG 1-753	University of Cincinnati	5109	Separated viscous flows using three-dimensional Navier-Stokes equations
Period 03/09/87-12/08/88	FY89: NASA Tech. Officer	TOTAL: \$64,202 CASE Category	Obligations
Prin. Invest. Ghia, K. N.	LARC/Liu, C. H.	41-Aero Engr	
Ghia, U.	LARC/Thomas, J. L.		
NAG 1-942	University of Cincinnati	5110	Evaluation of modal testing and model refinement technology
Period 02/15/89-09/30/89	FY89: \$52,640 NASA Tech. Officer	TOTAL: \$52,640 CASE Category	Obligations
Prin. Invest. Allemang, R. J.	LARC/Cooper, P. A.	42-Astro Engr	
Brown, D. L.	LARC/Johnson, J. W.		
NAG 1-953	University of Cincinnati	5111	Experiments in multivariable identification and control
Period 02/01/89-01/31/90	FY89: \$174,652 NASA Tech. Officer	TOTAL: \$174,652 CASE Category	Obligations
Prin. Invest. Allemang, R. J.	LARC/Taylor, R. S.	42-Astro Engr	
Slater, G. L.	LARC/Pappa, R. S.		
NAG 2-175	University of Cincinnati	5112	Study of optimal 3-D and 4-D trajectories for helicopters
Period 06/01/82-12/31/89	FY89: \$28,021 NASA Tech. Officer	TOTAL: \$162,954 CASE Category	Obligations
Prin. Invest. Slater, G. L.	ARC/Davis, T. J.	41-Aero Engr	
	ARC/Erzberger, H.		
NAG 3-397	University of Cincinnati	5113	Global relaxation with the PNS equations for internal flows
Period 03/01/83-01/31/90	FY89: \$20,142 NASA Tech. Officer	TOTAL: \$144,025 CASE Category	Obligations
Prin. Invest. Rubin, S. G.	LERC/Adamczyk, J. J.	41-Aero Engr	
NAG 3-506	University of Cincinnati	5114	Tem studies of LCF tested marm 200 single crystals
Period 12/28/83-01/14/90	FY89: \$8,080 NASA Tech. Officer	TOTAL: \$74,495 CASE Category	Obligations
Prin. Invest. Jayaraman, N.	LERC/Bhatt, R. T.	47-Materials Engr	
	LERC/Gray, H.		
NAG 3-582	University of Cincinnati	5115	Techniques for digital video image coding and implementation using systolic arrays
Period 11/10/84-12/31/88	FY89: NASA Tech. Officer	TOTAL: \$152,976 CASE Category	Obligations
Prin. Invest. Ramamoorthy, P. A.	LERC/Whyte, W. A.	45-Elec Engr	
	LERC/Miller, E. F.		
NAG 3-716	University of Cincinnati	5116	Research on hypersonic flow
Period 04/01/86-09/30/89	FY89: NASA Tech. Officer	TOTAL: \$38,553 CASE Category	Obligations
Prin. Invest. Rubin, S. G.	LERC/Benson, T. J.	41-Aero Engr	
Khosla, P. K.			
NAG 3-807	University of Cincinnati	5117	Radiation hard fast switching power devices
Period 07/15/87-02/15/89	FY89: NASA Tech. Officer	TOTAL: \$50,000 CASE Category	Obligations
Prin. Invest. Kapoor, V. J.	LERC/Krawczonek, W. M.	45-Elec Engr	
NAG 3-852	University of Cincinnati	5118	Optical waveguide technology utilizing silicon substrates for sensor applications
Period 12/15/87-12/14/89	FY89: \$50,000 NASA Tech. Officer	TOTAL: \$100,000 CASE Category	Obligations
Prin. Invest. Boyd, J. T.	LERC/Beheim, G.	13-Physics	
Jackson, H.			
NAG 3-938	University of Cincinnati	5119	Experimental study of the effects of reduced gravity on the fluid behavior on an enclosed heated vessel
Period 10/01/88-01/10/90	FY89: \$21,582 NASA Tech. Officer	TOTAL: \$37,467 CASE Category	Obligations
Prin. Invest. Disimile, P. J.	LERC/Ross, H. D.	46-Mech Engr	
NAG 3-948	University of Cincinnati	5120	A review of the long term effect of space exposure on rocket engine performance
Period 11/01/88-10/31/90	FY89: \$52,572 NASA Tech. Officer	TOTAL: \$52,572 CASE Category	Obligations
Prin. Invest. Disimile, P. J.	LERC/Millis, M. G.	42-Astro Engr	
Lin, R. Y.			
Khosla, P.			
NAG 3-960	University of Cincinnati	5121	A neural network architecture for implementation of expert systems for real-time monitoring
Period 01/01/89-12/31/89	FY89: \$72,822 NASA Tech. Officer	TOTAL: \$72,822 CASE Category	Obligations
Prin. Invest. Ramamoorthy, P. A.	LERC/Petrik, E. J.	29-Math/Computer, NEC	
NAG 3-995	University of Cincinnati	5122	Synthesis of novel electrically conductive polymers potential conducting Langmuir-Blodgett films and conducting polymers on defined surfaces
Period 02/01/89-01/31/90	FY89: \$58,048 NASA Tech. Officer	TOTAL: \$58,048 CASE Category	Obligations
Prin. Invest. Zimmer, H.	LERC/Meador, M. A.	12-Chemistry	
NAG 5-872	University of Cincinnati	5123	Multifrequency observations of selected extragalactic sources
Period 02/15/87-02/14/90	FY89: \$2,070 NASA Tech. Officer	TOTAL: \$21,582 CASE Category	Obligations
Prin. Invest. Sitko, M. L.	GSFC/Kondo, Y.	11-Astronomy	

NASA'S UNIVERSITY PROGRAM
OHIO (Continued)

NAGW 1407 University of Cincinnati 5124
A health monitoring technology center for space propulsion systems
Period Obligations
07/01/88-07/31/90 FY89: \$1,187,630 TOTAL: \$1,487,525
Prin. Invest. NASA Tech. Officer CASE Category
Gales, L. M. HQ-RS/Hartman, S. C. 49-Engr, NEC

NAS 8-34503 University of Cincinnati 5125
Investigation of improved modal parameter estimation procedure
Period Obligations
08/04/81-01/31/90 FY89: TOTAL: \$192,017
Prin. Invest. NASA Tech. Officer CASE Category
Rost, R. MSFC/Coleman, A. D. 41-Aero Engr
MSFC/Lewis, W. P.

NCA 2-366 University of Cincinnati 5126
Microbial activity and biomass in simulated Martian soils
Period Obligations
10/01/88-09/30/90 FY89: \$3,960 TOTAL: \$3,960
Prin. Invest. NASA Tech. Officer CASE Category
Vestal, J. R. ARC/Carle, G. C. 51-Biological Sci

NCC 3-33 University of Cincinnati 5127
III-V compound semiconductor technology
Period Obligations
07/28/83-02/27/90 FY89: \$50,000 TOTAL: \$663,978
Prin. Invest. NASA Tech. Officer CASE Category
Kapoor, V. J. LERC/Pouch, J. 19-Phys Sci, NEC
Dickman, J. E. LERC/Leonard, R. F.

NCC 3-36 University of Cincinnati 5128
Electronic properties of diamond-like carbon films for solid state devices
Period Obligations
12/15/83-02/11/89 FY89: TOTAL: \$200,000
Prin. Invest. NASA Tech. Officer CASE Category
Kapoor, V. J. LERC/Mirtich, M. J. 19-Phys Sci, NEC
LERC/Banks, B. A.

NGT 00-050-086 University of Cincinnati 5129
NASA graduate student researchers program
Period Obligations
07/01/86-06/30/89 FY89: TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Kapoor, V. J. HQ-LE/Owens, F. C. 45-Elec Engr

NGT 00-050-416 University of Cincinnati 5130
NASA graduate student researchers program
Period Obligations
09/01/89-08/31/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Ghia, K. N. HQ-XE/Owens, F. C. 49-Engr, NEC

NGT 00-050-492 University of Cincinnati 5131
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Kapoor, V. J. HQ-XE/Owens, F. C. 45-Elec Engr

NGT 00-070-007 University of Cincinnati 5132
Graduate student researchers underrepresented minority focus program
Period Obligations
03/15/87-03/14/88 FY89: TOTAL: \$3,731
Prin. Invest. NASA Tech. Officer CASE Category
Ghia, K. N. HQ-LE/Owens, F. C. 41-Aero Engr

NGT 00-070-048 University of Cincinnati 5133
Graduate student researchers underrepresented minority focus program
Period Obligations
09/01/87-08/31/89 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Huston, R. L. HQ-XE/Owens, F. C. 49-Engr, NEC

NGT 00-070-049 University of Cincinnati 5134
Graduate student researchers underrepresented minority focus program
Period Obligations
09/01/87-08/31/89 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Huston, R. L. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 00-070-151 University of Cincinnati 5135
NASA graduate student researchers program
Period Obligations
07/01/89-08/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Rubin, S. G. HQ-XE/Owens, F. C. 45-Elec Engr

NSG 3022 University of Cincinnati 5136
Investigation of a new family of semiconductor diodes based upon bulk effects of deep impurities
Period Obligations
07/01/74-06/30/90 FY89: \$35,000 TOTAL: \$851,619
Prin. Invest. NASA Tech. Officer CASE Category
Henderson, H. T. LERC/Sundberg, G. R. 45-Elec Engr
LERC/Myers, I. T.

NSG 3188 University of Cincinnati 5137
Investigations into the geometry of straight and spiral bevel gears
Period Obligations
04/01/78-10/31/89 FY89: \$60,000 TOTAL: \$367,906
Prin. Invest. NASA Tech. Officer CASE Category
Huston, R. L. LERC/Oswald, F. B. 46-Mech Engr

NAG 3-526 University of Dayton 5138
Numerical simulation of axisymmetric sheap layers
Period Obligations
02/20/84-04/30/89 FY89: TOTAL: \$188,571
Prin. Invest. NASA Tech. Officer CASE Category
Scott, J. N. LERC/Stone, J. R. 41-Aero Engr
Whitford, D. H. LERC/Rice, E.

NAG 3-665 University of Dayton 5139
Numerical simulation of the flow field over ice accretion shapes
Period Obligations
10/30/85-03/28/89 FY89: TOTAL: \$152,231
Prin. Invest. NASA Tech. Officer CASE Category
Scott, J. N. LERC/Polapczuk, M. G. 41-Aero Engr
Hankey, W.

NASA'S UNIVERSITY PROGRAM
OHIO (Continued)

NAS 5-28297	University of Dayton	5140	Verification and analysis of satellite derived data <i>Period</i> 11/01/84-10/31/89 <i>Prin. Invest.</i> Luers, J. K.	<i>Obligations</i> FY89: \$57,643 <i>NASA Tech. Officer</i> GSFC/Schmidlin, F. J.	TOTAL: \$530,552 <i>CASE Category</i> 31-Atmos Sci
NAG 3-713	University of Toledo	5148	Computational fluid dynamic investigation of flow in arcjet thruster <i>Period</i> 04/15/86-04/15/89 <i>Prin. Invest.</i> Keith, T. G., Jr. Pawles, G. E.	<i>Obligations</i> FY89: <i>NASA Tech. Officer</i> LERC/Curran, F. M. LERC/Sarmiento, C. J.	TOTAL: \$50,000 <i>CASE Category</i> 46-Mech Engr
NGT 00-050-082	University of Dayton	5141	NASA graduate student researchers program <i>Period</i> 06/01/87-11/30/89 <i>Prin. Invest.</i> Fraker, J. R.	<i>Obligations</i> FY89: \$9,000 <i>NASA Tech. Officer</i> HQ-XE/Owens, F. C.	TOTAL: \$63,000 <i>CASE Category</i> 41-Aero Engr
NAG 3-742	University of Toledo	5149	Optimization of propfan blades with dynamic constraints <i>Period</i> 09/01/86-11/04/89 <i>Prin. Invest.</i> Keith, T. G. Murthy, D. V.	<i>Obligations</i> FY89: \$67,562 <i>NASA Tech. Officer</i> LERC/Stefko, G. L. LERC/Kiraly, L. J.	TOTAL: \$175,362 <i>CASE Category</i> 41-Aero Engr
NAG 3-42	University of Toledo	5142	Digital television simulation facility <i>Period</i> 03/31/80-09/30/88 <i>Prin. Invest.</i> Kwatra, S. C.	<i>Obligations</i> FY89: <i>NASA Tech. Officer</i> LERC/Whyte, W. A. LERC/Miller, E. F.	TOTAL: \$401,885 <i>CASE Category</i> 45-Elec Engr
NAG 3-757	University of Toledo	5150	Implicit numerical methods for vortex stabilized arcs <i>Period</i> 04/17/87-06/14/90 <i>Prin. Invest.</i> Keith, T. G. Pawlas, G. E.	<i>Obligations</i> FY89: \$26,000 <i>NASA Tech. Officer</i> LERC/Curran, F. LERC/Sarmiento, C.	TOTAL: \$71,000 <i>CASE Category</i> 46-Mech Engr
NAG 3-72	University of Toledo	5143	Numerical simulation of heat transfer phenomena occurring during deicing of aircraft components <i>Period</i> 06/01/80-12/27/89 <i>Prin. Invest.</i> Dewitt, K. J. Keith, T. G.	<i>Obligations</i> FY89: \$40,000 <i>NASA Tech. Officer</i> LERC/Vargas, M. LERC/Reinmann, J. J.	TOTAL: \$279,500 <i>CASE Category</i> 41-Aero Engr
NAG 3-799	University of Toledo	5151	System study for application of VSAT at Ku band <i>Period</i> 05/30/87-01/29/90 <i>Prin. Invest.</i> Kwatra, S. C. Jamali, M. M.	<i>Obligations</i> FY89: \$48,648 <i>NASA Tech. Officer</i> LERC/Budinger, J. M. LERC/Harrold, J. L.	TOTAL: \$183,973 <i>CASE Category</i> 45-Elec Engr
NAG 3-865	University of Toledo	5152	Digital modem development <i>Period</i> 01/05/88-02/27/90 <i>Prin. Invest.</i> Kwatra, S. C. Jamali, M. M.	<i>Obligations</i> FY89: \$60,380 <i>NASA Tech. Officer</i> LERC/Budinger, J. M. LERC/Harrold, J. L.	TOTAL: \$93,241 <i>CASE Category</i> 45-Elec Engr
NAG 3-157	University of Toledo	5144	Interference susceptibility of digital television systems <i>Period</i> 01/09/81-09/13/90 <i>Prin. Invest.</i> Kwatra, S. C.	<i>Obligations</i> FY89: \$80,000 <i>NASA Tech. Officer</i> LERC/Stevens, G. H.	TOTAL: \$595,466 <i>CASE Category</i> 22-Computer Science
NAG 3-577	University of Toledo	5145	Fluid physics phenomena of resistojet thruster <i>Period</i> 10/15/84-03/12/90 <i>Prin. Invest.</i> Dewitt, K. J. Keith, T. G.	<i>Obligations</i> FY89: \$36,000 <i>NASA Tech. Officer</i> LERC/Morren, W. E. LERC/Penko, P. F.	TOTAL: \$146,000 <i>CASE Category</i> 19-Phys Sci, NEC
NAG 3-699	University of Toledo	5146	Computer architecture evaluation for structural analysis computations <i>Period</i> 02/10/86-08/08/89 <i>Prin. Invest.</i> Standley, H. M.	<i>Obligations</i> FY89: <i>NASA Tech. Officer</i> LERC/Kiraly, L. J.	TOTAL: \$169,632 <i>CASE Category</i> 49-Engr, NEC
NAG 3-708	University of Toledo	5147	Electrical performance characteristics of high power inverters for space power applications <i>Period</i> 03/05/86-12/18/89 <i>Prin. Invest.</i> Stuart, T. A. King, R. J.	<i>Obligations</i> FY89: \$33,643 <i>NASA Tech. Officer</i> LERC/Schwarze, G. E. LERC/Baumann, E. D.	TOTAL: \$211,183 <i>CASE Category</i> 45-Elec Engr
NAG 3-910	University of Toledo	5153	Surface tension driven flows for a droplet in a microgravity environment <i>Period</i> 06/15/88-06/14/89 <i>Prin. Invest.</i> Oliver, D. O. Dewitt, K. J.	<i>Obligations</i> FY89: <i>NASA Tech. Officer</i> LERC/Chai, A. T.	TOTAL: \$7,600 <i>CASE Category</i> 43-Chem Engr
NAG 3-937	University of Toledo	5154	Analysis and evaluation of an integrated laminar flow control propulsion system <i>Period</i> 09/19/88-06/18/90 <i>Prin. Invest.</i> Keith, T. G. Dewitt, K. J./Hrach, F. J.	<i>Obligations</i> FY89: <i>NASA Tech. Officer</i> LERC/Luidens, R. W.	TOTAL: \$31,000 <i>CASE Category</i> 41-Aero Engr
NAG 3-959	University of Toledo	5155	The current mode slide controlled converter <i>Period</i> 01/06/89-09/30/90 <i>Prin. Invest.</i> Stuart, T. A. King, R. J.	<i>Obligations</i> FY89: \$33,318 <i>NASA Tech. Officer</i> LERC/Gruber, R. P.	TOTAL: \$33,318 <i>CASE Category</i> 45-Elec Engr

NASA'S UNIVERSITY PROGRAM
OHIO (Continued)

NAG 3-975 University of Toledo 5156
 Efficient partitioning and assignment of programs for parallel execution
Period Obligations
 02/07/89-02/06/90 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. NASA Tech. Officer CASE Category
 Standley, H. M. LERC/Kiraly, L. J. 41-Aero Engr
 LERC/Janetzke, D. C.

NAG 5-1065 University of Toledo 5164
 Large-angle scattering in reflection nebulae and the grain-size distribution
Period Obligations
 08/01/88-07/31/90 FY89: \$25,100 TOTAL: \$39,200
Prin. Invest. NASA Tech. Officer CASE Category
 Witt, A. GSFC/West, D. 11-Astronomy

NAG 3-1036 University of Toledo 5157
 Demonstration of CMOS visi circuit prototyping in support of the site facility
Period Obligations
 04/14/89-12/30/89 FY89: \$51,631 TOTAL: \$51,631
Prin. Invest. NASA Tech. Officer CASE Category
 Smith, E. D. LERC/Andro, M. 45-Elec Engr
 Thorjornsen, A. R.

NAG 5-1069 University of Toledo 5165
 A B initis models of the solar atmosphere SMM
Period Obligations
 09/01/88-02/28/90 FY89: TOTAL: \$14,579
Prin. Invest. NASA Tech. Officer CASE Category
 Anderson, L. S. GSFC/Bullock, G. D. 19-Phys Sci, NEC
 GSFC/Gurman, J. B.

NAG 3-1068 University of Toledo 5158
 Advanced models for aeroelasticity analysis of propulsion system
Period Obligations
 08/16/89-08/15/90 FY89: \$85,000 TOTAL: \$85,000
Prin. Invest. NASA Tech. Officer CASE Category
 Keith, T. G. LERC/Stefko, G. L. 41-Aero Engr
 Mahajan, A. J. LERC/Kiraly, L. J.

NCC 3-34 University of Toledo 5166
 Mass transport phenemona between bubbles and dissolved gases in liquid under reduced gravity conditions
Period Obligations
 11/15/83-03/10/90 FY89: \$75,000 TOTAL: \$327,891
Prin. Invest. NASA Tech. Officer CASE Category
 Dewitt, K. J. LERC/Chai, A. T. 49-Engr, NEC
 Yung, C. N.

NAG 5-253 University of Toledo 5159
 Observation of stellor winds in two massive binary stars in known orbits
Period Obligations
 07/15/82-07/31/90 FY89: TOTAL: \$42,493
Prin. Invest. NASA Tech. Officer CASE Category
 Morrison, N. D. GSFC/Kondo, Y. 11-Astronomy
 Grigsby, J. A.

NCC 3-69 University of Toledo 5167
 Fluid and thermal analysis of propulsion systems
Period Obligations
 09/01/86-08/31/90 FY89: \$68,654 TOTAL: \$208,007
Prin. Invest. NASA Tech. Officer CASE Category
 Dewitt, K. J. LERC/Hacha, T. H. 41-Aero Engr
 Chao, D. F.

NAG 5-586 University of Toledo 5160
 Database interfaces on NASA's heterogeneous database system
Period Obligations
 07/15/85-09/30/96 FY89: \$1,036 TOTAL: \$26,036
Prin. Invest. NASA Tech. Officer CASE Category
 Kertz, G. GSFC/Jacobs, B. 22-Computer Science
 GSFC/Berbert, J.

NCC 3-120 University of Toledo 5168
 Development and application of viscoplastic models in nonlinear structural analysis
Period Obligations
 12/05/88-12/04/89 FY89: \$80,000 TOTAL: \$80,000
Prin. Invest. NASA Tech. Officer CASE Category
 Keith, T. G. LERC/Halford, G. R. 42-Astro Engr
 LERC/Kielb, R. E.

NAG 5-954 University of Toledo 5161
 Interacting of several selected binary star system
Period Obligations
 09/01/87-09/30/90 FY89: \$11,845 TOTAL: \$28,445
Prin. Invest. NASA Tech. Officer CASE Category
 Bopp, B. W. GSFC/West, D. 11-Astronomy
 Parsons, S. B.

NCC 3-126 University of Toledo 5169
 Microstrips antenna arreups
Period Obligations
 02/18/89-02/18/90 FY89: \$36,085 TOTAL: \$36,085
Prin. Invest. NASA Tech. Officer CASE Category
 Lee, K. F. LERC/Lee, R. O. 45-Elec Engr

NAG 5-970 University of Toledo 5162
 Ab initis models of stellar atmosphere
Period Obligations
 09/01/87-09/30/90 FY89: \$28,577 TOTAL: \$44,189
Prin. Invest. NASA Tech. Officer CASE Category
 Anderson, L. S. GSFC/West, D. 11-Astronomy

NGT 00-050-371 University of Toledo 5170
 NASA graduate student researchers program
Period Obligations
 08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
 Dewitt, K. J. HQ-XE/Owens, F. C. 43-Chem Engr
 Oliver, D. O.

NAG 5-979 University of Toledo 5163
 Resonance line profiles in tote O and early B type main sequence stars
Period Obligations
 09/01/87-08/31/90 FY89: TOTAL: \$28,439
Prin. Invest. NASA Tech. Officer CASE Category
 Morrison, N. D. GSFC/Kondo, Y. 11-Astronomy
 Grigsby, J. A.

NSG 3139 University of Toledo 5171
 Stability analysis of wind turbines with long flexible blades
Period Obligations
 02/22/77-01/19/90 FY89: \$79,975 TOTAL: \$693,152
Prin. Invest. NASA Tech. Officer CASE Category
 Keith, T. G., Jr. LERC/Stefko, G. L. 41-Aero Engr
 Reddy, T. S. LERC/Kiraly, L. J.
 Bakhle, M. A.

NASA'S UNIVERSITY PROGRAM **OHIO (Continued)**

NAG 3-793 **Wittenberg University** **5172**
Radiation effects on power transistor performance
Period *Obligations*
04/01/87-04/17/90 FY89: \$96,278 TOTAL: \$162,456
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Frasca, A. J. LERC/Schwarze, G. E. 13-Physics

NAG 5-956 **Wright State University** **5173**
Design/study of a spacecraft cooling system
Period *Obligations*
07/15/87-11/30/89 FY89: \$38,163 TOTAL: \$139,455
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Faghri, A. GSFC/Swanson, T. D. 46-Mech Engr
GSFC/McIntosh, R.

NAG 9-263 **Wright State University** **5174**
Physiologic effects and tolerance of hemorrhagic shock modeled primates during +gx acceleration
Period *Obligations*
12/01/87-04/01/89 FY89: TOTAL: \$107,585
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hamilton, G. C. JSC/Boyce, J. 51-Biological Sci
Olson, J. E.
Stepaniak, P. C.

NAGW 1738 **Wright State University** **5175**
Influence of the root cap and mucilage on root growth and gravitropism
Period *Obligations*
03/01/89-02/28/90 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Moore, R. HQ-EB/Halstead, T. W. 54-Env Biology

NCC 2-229 **Wright State University** **5176**
Evaluation of putative neurochemical intermediaries in space motion sickness
Period *Obligations*
01/01/83-12/31/89 FY89: \$65,000 TOTAL: \$516,387
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Crampton, G. H. ARC/Daunton, N. G. 51-Biological Sci
Lucot, J. B. ARC/Corcoran, M. L.

NGT 36-024-790 **Wright State University** **5177**
Specialized post MD training in aerospace medicine
Period *Obligations*
01/01/85-12/31/89 FY89: \$495,758 TOTAL: \$3,603,809
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Mohler, S. HQ-EB/Evans, F. D. 59-Life Sci, NEC
HQ-EB/Nicogossian, A. E.

OKLAHOMA

NAG 1-694 **Oklahoma State University** **5178**
Growth and characterization of materials for tunable lasers in the near infrared spectral region
Period *Obligations*
08/01/86-04/30/90 FY89: \$75,462 TOTAL: \$244,358
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Powell, R. C. LARC/Brockman, P. 13-Physics
Martin, J. J. LARC/Hess, R. V.

NASW 4000 **Oklahoma State University** **5179**
Management and operation of the aerospace educator services project
Period *Obligations*
10/01/84-12/31/89 FY89: \$3,149,506 TOTAL: \$12,275,589
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wiggins, K. E. HQ-LF/Bilbrough, L. B. 99-Multi-Discip
Erich, N.

NCCW 5 **Oklahoma State University** **5180**
Teacher in space project
Period *Obligations*
10/16/85-08/31/90 FY89: \$239,993 TOTAL: \$3,168,221
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wiggins, K. HQ-XE/Bilbrough, L. 99-Multi-Discip

NGT 00-070-092 **Oklahoma State University** **5181**
Graduate student researchers underrepresented minority focus program
Period *Obligations*
07/01/89-06/30/90 FY89: TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Martin, J. HQ-XE/Owens, F. C. 13-Physics

NAG 1-886 **University of Oklahoma - Norman** **5182**
Integrated aerodynamics/propulsion study for generic aerospace planes based on waverider concepts
Period *Obligations*
05/20/88-10/19/89 FY89: \$124,000 TOTAL: \$124,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Emanuel, G. LARC/Bauer, S. X. 41-Aero Engr
Rasmussen, M. L. LARC/Wood, R. M.

NAG 1-990 **University of Oklahoma - Norman** **5183**
Extended temperature range pressure sensors
Period *Obligations*
03/10/89-06/30/89 FY89: \$31,979 TOTAL: \$31,979
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Kahng, S. K. LARC/Chapman, J. J. 49-Engr, NEC
LARC/Kern, F. A.

NAG 1-1054 **University of Oklahoma - Norman** **5184**
Nondestructive characterization of carbon-carbon composites
Period *Obligations*
09/01/89-08/31/90 FY89: \$29,840 TOTAL: \$29,840
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Kline, R. A. LARC/Madaras, E. I. 19-Phys Sci, NEC
Striz, A. J.

NAG 5-850 **University of Oklahoma - Norman** **5185**
Retrospective studies of the use of LANDSAT data in hydrologic models for land atmosphere analysis
Period *Obligations*
10/01/86-12/14/89 FY89: TOTAL: \$181,914
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Duchon, C. E. GSFC/Oseroff, H. 19-Phys Sci, NEC
Langran, K. J.

NAG 8-137 **University of Oklahoma - Norman** **5186**
A decision support system for tolerance allocation
Period *Obligations*
08/21/89-08/20/90 FY89: \$50,582 TOTAL: \$50,582
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Pulat, P. S. MSFC/Fernandez, K. R. 46-Mech Engr
Raman, S. MSFC/Gillis, A.

NASA'S UNIVERSITY PROGRAM **OKLAHOMA (Continued)**

NAG 9-228 University of Oklahoma - Norman 5187
Variational high resolution data assimilation and short range weather forecasting
Period *Obligations*
05/15/87-08/15/90 FY89: \$85,000 TOTAL: \$255,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Sasaki, Y. K. JSC/Whitehead, V. 31-Atmos Sci

NGT 00-050-412 University of Oklahoma - Norman 5188
NASA graduate student researchers program
Period *Obligations*
08/15/89-08/15/90 FY89: \$17,998 TOTAL: \$17,998
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Kline, R. A. HQ-XE/Owens, F. C. 46-Mech Engr

OREGON

NAGW 1348 Oregon Graduate Center 5189
Global atmospheric gases experiment
Period *Obligations*
04/01/88-01/31/90 FY89: \$662,854 TOTAL: \$662,854
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Rasmussen, R. A. HQ-EE/Kurylo, M. J. 31-Atmos Sci
HQ-EE/Watson, R. T.

NAS 8-35333 Oregon Health Sciences University 5190
Cell partition in two polymer aqueous phases
Period *Obligations*
05/05/83-12/31/89 FY89: \$70,000 TOTAL: \$528,818
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Brooks, D. E. MSFC/Gardner, L. B. 59-Life Sci, NEC
MSFC/Snyder, R. S.

NAG 1-935 Oregon State University 5191
Cloud properties as deduced from satellite observations
Period *Obligations*
12/01/88-02/14/90 FY89: \$130,169 TOTAL: \$130,169
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Coakley, J. A. LARC/McDougal, D. S. 31-Atmos Sci
LARC/Owens, T. L.

NAG 5-1105 Oregon State University 5192
A geodetic network in the gulf and peninsular province of the Californias
Period *Obligations*
10/15/88-02/14/90 FY89: \$52,413 TOTAL: \$52,413
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Ness, G. E. GSFC/Welker, J. E. 32-Geological Sci

NAG 9-63 Oregon State University 5193
Chemical studies of lunar and meteoritic samples
Period *Obligations*
02/01/83-02/01/90 FY89: \$83,001 TOTAL: \$540,182
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Schmitt, R. A. JSC/Browne, I. D. 32-Geological Sci
Hughes, S. S.

NAGW 730 Oregon State University 5194
Temporal and spatial variability of sea surface winds
Period *Obligations*
02/01/85-09/30/89 FY89: \$81,963 TOTAL: \$572,287
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Chelton, D. B. HQ-EE/Lagerloef, G. S. 33-Oceanography

NAGW 869 Oregon State University 5195
Analysis of AVHRR, CZCS and historical in situ chlorophyll data off the Oregon coast
Period *Obligations*
02/01/86-07/31/89 FY89: \$8 TOTAL: \$367,840
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Chelton, D. B. HQ-EE/Yoder, J. A. 33-Oceanography
Strub, P. T. HQ-EE/Wilson, W. S.

NAGW 1123 Oregon State University 5196
Student program in satellite oceanography
Period *Obligations*
07/01/87-09/30/89 FY89: TOTAL: \$296,410
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Chelton, D. B. HQ-EE/Richman, J. G. 33-Oceanography
Strub, P. T. HQ-EE/Wilson, W. S.

NAGW 1127 Oregon State University 5197
Waves and instability in the atmospheres of Mars
Period *Obligations*
07/01/87-09/30/89 FY89: \$58,051 TOTAL: \$111,707
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Barnes, J. R. HQ-EL/Bergstrahl, J. T. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NAGW 1251 Oregon State University 5198
Event scale relationships between surface velocity temperature and chlorophyll in the costal ocean as seen by satellite
Period *Obligations*
12/15/87-12/14/89 FY89: \$84,546 TOTAL: \$248,303
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Strub, P. T. HQ-EE/Lewis, M. R. 33-Oceanography
HQ-EE/Wilson, W. S.

NAGW 1253 Oregon State University 5199
Analysis of components of the gravitropic response in planets using purified plasma membrane vesicles
Period *Obligations*
01/01/88-12/31/89 FY89: \$45,000 TOTAL: \$89,999
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lomax, T. L. HQ-EB/Halstead, T. W. 51-Biological Sci

NAGW 1305 Oregon State University 5200
Development of numerical models
Period *Obligations*
12/01/87-11/30/89 FY89: \$83,811 TOTAL: \$180,553
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bennett, A. F. HQ-EE/Richman, J. G. 33-Oceanography
HQ-EE/Wilson, W. S.

NAGW 1316 Oregon State University 5201
Satellite studies of biological physical processes in the eastern north pacific
Period *Obligations*
06/01/88-11/30/89 FY89: \$480,010 TOTAL: \$707,727
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Abbott, M. R. HQ-EE/Lewis, M. R. 33-Oceanography
HQ-EE/Wilson, S. W.

NAGW 1451 Oregon State University 5202
Dynamics of the Antarctic circumpolar current sea level variability observed w/the GEOSAT altimeter
Period *Obligations*
09/01/88-09/30/89 FY89: \$225,010 TOTAL: \$225,010
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Richman, J. G. HQ-EE/Lagerloef, G. S. 33-Oceanography
HQ-EE/Wilson, W. S.

NASA'S UNIVERSITY PROGRAM
OREGON (Continued)

NAGW 1460	Oregon State University	5203	NGT 00-050-321	Oregon State University	5211
Geographic information analysis			NASA graduate student researchers program		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
07/01/88-09/30/89	FY89: \$227,979	TOTAL: \$227,979	08/01/88-07/31/90	FY89: \$18,000	TOTAL: \$18,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Ropple, W. J.	HQ-EE/Lesane, G.	54-Env Biology	Lomax, T.	HQ-XE/Owens, F. C.	51-Biological Sci
NAGW 1717	Oregon State University	5204	NGT 00-050-351	Oregon State University	5212
Estimating major ecosystem fluxes across the Oregon transect			NASA graduate student researchers program		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
04/01/89-09/30/89	FY89: \$63,843	TOTAL: \$63,843	09/01/88-08/31/89	FY89:	TOTAL: \$18,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Waring, R. H.	HQ-EE/Wickland, D. E.	39-Env Sci, NEC	Frenkel, R.	HQ-XE/Owens, F. C.	32-Geological Sci
Running, S. W.	HQ-EE/Ruzek, M. J.				
Peterson, D. L.					
NAS 1-18992	Oregon State University	5205	NGT 00-050-455	Oregon State University	5213
ERBE science team support			NASA graduate student researchers program		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
09/20/89-09/20/92	FY89: \$110,000	TOTAL: \$110,000	07/01/89-06/30/90	FY89: \$18,000	TOTAL: \$18,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Coakley, J. A.	LARC/Cooper, J. E.	31-Atmos Sci	Lomax, T.	HQ-XE/Owens, F. C.	59-Life Sci, NEC
	LARC/Barkstrom, B.				
NAS 5-30553	Oregon State University	5206	NGT 00-050-520	Oregon State University	5214
EOS interdisciplinary study			NASA graduate student researchers program		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
06/30/89-12/14/90	FY89: \$45,000	TOTAL: \$45,000	08/01/89-07/31/90	FY89: \$17,948	TOTAL: \$17,948
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Abbott, M.	GSFC/Soffen, G.	31-Atmos Sci	Waring, R.	HQ-XE/Owens, F. C.	39-Env Sci, NEC
NCA 2-205	Oregon State University	5207	NSG 7178	Oregon State University	5215
Dust transport in a Mars general circulation model			Examination of the suggested modes of origin of channels found on the Moon and Mars		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
04/01/87-06/30/89	FY89:	TOTAL: \$31,758	01/01/76-09/30/89	FY89: \$22,500	TOTAL: \$383,032
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Barnes, J. R.	ARC/Pollack, J. B.	31-Atmos Sci	Komar, P. D.	HQ-EL/Underwood, J. R.	32-Geological Sci
				HQ-EL/Boyce, J. M.	
NCC 2-569	Oregon State University	5208	NAG 1-697	Portland State University	5216
Using LANDSAT to provide potato production estimates to Columbia basin farmers and processors			Tropospheric HO experimental studies		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
05/01/88-10/31/89	FY89: \$194,370	TOTAL: \$194,370	09/01/86-08/31/90	FY89: \$145,000	TOTAL: \$495,347
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
English, M. E.	ARC/Lawless, J. G.	54-Env Biology	O'Brien, R. J.	LARC/Hoell, J. M.	31-Atmos Sci
			Hard, T. M.	LARC/Bendura, R. J.	
			Migliore, H. J.		
NGT 00-050-167	Oregon State University	5209	NGT 00-070-054	Portland State University	5217
NASA graduate student researchers program			Graduate student researchers underrepresented minority focus program		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
06/01/87-05/31/90	FY89: \$18,000	TOTAL: \$53,074	09/16/87-09/15/89	FY89: \$18,000	TOTAL: \$36,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Barnes, J. R.	HQ-XE/Owens, F. C.	31-Atmos Sci	O'Brien, R. J.	HQ-XE/Owens, F. C.	12-Chemistry
NGT 00-050-244	Oregon State University	5210	NAG 1-963	University of Oregon - Eugene	5218
NASA graduate student researchers program			Atmospheric and spectroscopic research in the far infrared		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
09/01/87-08/31/90	FY89: \$18,000	TOTAL: \$32,000	02/22/89-02/21/90	FY89: \$119,530	TOTAL: \$119,530
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Frenkel, R. E.	HQ-XE/Owens, F. C.	32-Geological Sci	Park, K. J.	LARC/Nolt, I. G.	31-Atmos Sci

NASA'S UNIVERSITY PROGRAM **OREGON (Continued)**

NAG 1-1044 University of Oregon - Eugene 5219
 Visualizing boundary layer transition by infrared scanning
Period Obligations
 08/01/89-07/31/90 FY89: \$42,217 TOTAL: \$42,217
Prin. Invest. NASA Tech. Officer CASE Category
 Donnelly, R. J. LARC/Lawing, P. L. 41-Aero Engr
 LARC/Johnson Jr., W. G.

NAG 1-1046 University of Oregon - Eugene 5220
 Fast algorithms for gas-phase reactions in air
Period Obligations
 08/07/89-08/06/90 FY89: \$40,456 TOTAL: \$40,456
Prin. Invest. NASA Tech. Officer CASE Category
 Hansen, C. F. LARC/Sutton, K. 41-Aero Engr
 LARC/Gnoffo, P. A.

NAG 2-383 University of Oregon - Eugene 5221
 Qualitative mechanism models and the rationalization of procedures
Period Obligations
 01/01/86-06/30/89 FY89: TOTAL: \$139,593
Prin. Invest. NASA Tech. Officer CASE Category
 Fuller, C. A. ARC/Remington, R. W. 22-Computer Science
 ARC/Palmer, E.

NAG 5-755 University of Oregon - Eugene 5222
 Lithospheric dynamics of the southern California region
Period Obligations
 03/15/86-04/30/90 FY89: \$65,147 TOTAL: \$248,247
Prin. Invest. NASA Tech. Officer CASE Category
 Humphreys, E. D. GSFC/Frey, H. V. 32-Geological Sci

PENNSYLVANIA

NAG 1-190 Carnegie - Mellon University 5223
 Advanced automated control of aircraft in terminal
Period Obligations
 06/01/81-11/30/89 FY89: \$289,239 TOTAL: \$1,111,272
Prin. Invest. NASA Tech. Officer CASE Category
 Siewiorek, D. P. LARC/Padilla, P. A. 45-Elec Engr
 Segall, Z. LARC/Butler, R. W.

NAG 1-903 Carnegie - Mellon University 5224
 Optical linear algebra processors for CFD
Period Obligations
 08/01/88-11/30/88 FY89: TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
 Casasent, D. LARC/Bryant, W. H. 45-Elec Engr
 LARC/Murray, N. D.

NAG 2-549 Carnegie - Mellon University 5225
 Numerical simulation of the flow field about non axisymmetric inlet and bleed holes near the throat of inlets
Period Obligations
 09/15/88-10/31/89 FY89: \$58,220 TOTAL: \$58,220
Prin. Invest. NASA Tech. Officer CASE Category
 Shih, T. ARC/Chyu, W. J. 41-Aero Engr
 ARC/Bencze, D. P.

NAG 3-166 Carnegie - Mellon University 5226
 Turbulent flow in cryogenic face seals
Period Obligations
 03/15/81-11/18/87 FY89: TOTAL: \$272,561
Prin. Invest. NASA Tech. Officer CASE Category
 Hughes, W. F. LERC/Hendricks, R. C. 46-Mech Engr
 Basu, P.

NAG 3-463 Carnegie - Mellon University 5227
 Modeling the microstructural effects of hydrogen related fatigue crack growth in nickel based super alloy single crystals
Period Obligations
 10/15/83-12/14/89 FY89: \$100,000 TOTAL: \$628,862
Prin. Invest. NASA Tech. Officer CASE Category
 Bernstein, I. M. LERC/Dreshfield, R. L. 47-Materials Engr
 Thompson, A. W.
 Sirignano, W. A.

NAG 3-689 Carnegie - Mellon University 5228
 Rotary engine spray modelling
Period Obligations
 01/10/86-12/31/89 FY89: \$74,994 TOTAL: \$260,146
Prin. Invest. NASA Tech. Officer CASE Category
 Ramos, J. I. LERC/Nguyen, H. L. 41-Aero Engr

NAG 3-811 Carnegie - Mellon University 5229
 Base reaction optimization for manipulators with redundant kinematics
Period Obligations
 07/06/87-07/04/90 FY89: \$52,001 TOTAL: \$147,482
Prin. Invest. NASA Tech. Officer CASE Category
 Desa, S. LERC/Lawrence, C. 46-Mech Engr

NAG 3-929 Carnegie - Mellon University 5230
 Numerical study of the flow fields inside gas turbine engines
Period Obligations
 10/28/88-12/26/89 FY89: TOTAL: \$62,120
Prin. Invest. NASA Tech. Officer CASE Category
 Shih, T. I. LERC/Roelke, R. J. 41-Aero Engr
 LERC/Moore, R. D.

NAG 3-997 Carnegie - Mellon University 5231
 Numerical simulation of the flow field
Period Obligations
 01/23/89-12/31/89 FY89: \$77,942 TOTAL: \$77,942
Prin. Invest. NASA Tech. Officer CASE Category
 Shih, T. I. LERC/Nguyen, H. L. 47-Materials Engr

NAG 3-1009 Carnegie - Mellon University 5232
 Numerical studies of combustion process in HSCT and small gas turbine engines
Period Obligations
 02/06/89-02/05/90 FY89: \$100,000 TOTAL: \$100,000
Prin. Invest. NASA Tech. Officer CASE Category
 Ramos, J. I. LERC/Nguyen, H. L. 46-Mech Engr
 Shih, T. I.

NAG 5-1046 Carnegie - Mellon University 5233
 The designs and implementation of algorithms for a heterogeneous arrangement of high performance processors
Period Obligations
 04/15/88-11/14/89 FY89: \$22,000 TOTAL: \$61,987
Prin. Invest. NASA Tech. Officer CASE Category
 Siewiorek, D. P. GSFC/Dorband, J. E. 22-Computer Science
 GSFC/Fischer, J. R.

**NASA'S UNIVERSITY PROGRAM
PENNSYLVANIA (Continued)**

NAG 5-1091 Carnegie - Mellon University 5234
Novel technology and advanced control for space manipulators
Period Obligations
10/01/88-01/31/90 FY89: TOTAL: \$99,853
Prin. Invest. NASA Tech. Officer CASE Category
Khosla, P. K. GSFC/Andary, J. F. 49-Engr, NEC

NAG 8-126 Carnegie - Mellon University 5235
Atomization of liquid jets from injection elements in liquid rocket combustion chambers
Period Obligations
04/24/89-04/24/92 FY89: \$317,018 TOTAL: \$317,018
Prin. Invest. NASA Tech. Officer CASE Category
Chigier, N. MSFC/Gross, K. W. 49-Engr, NEC
MSFC/Eskridge, R.

NAG 9-247 Carnegie - Mellon University 5236
Correlation filters for orientation estimation
Period Obligations
09/01/87-01/01/89 FY89: TOTAL: \$30,000
Prin. Invest. NASA Tech. Officer CASE Category
Kumar, V. JSC/Juday, R. 42-Astro Engr

NAG 9-383 Carnegie - Mellon University 5237
Optical morphological image processor
Period Obligations
06/01/89-06/01/90 FY89: \$30,000 TOTAL: \$30,000
Prin. Invest. NASA Tech. Officer CASE Category
Casasent, D. JSC/Juday, R. D. 45-Elec Engr

NAGW 1175 Carnegie - Mellon University 5238
Autonomous planetary rover
Period Obligations
10/01/87-09/30/89 FY89: \$2,000,000 TOTAL: \$3,000,000
Prin. Invest. NASA Tech. Officer CASE Category
Kanade, T. HQ-RC/Montemerlo, M. D. 49-Engr, NEC
Mitchell, T. HQ-RC/Solloway, C. B.
Whittaker, W. L.

NAS 2-13045 Carnegie - Mellon University 5239
Membership in industrial affiliates program
Period Obligations
05/24/89-05/23/90 FY89: \$100,000 TOTAL: \$100,000
Prin. Invest. NASA Tech. Officer CASE Category
Siewiorek, D. ARC/McKellar, D. 29-Math/Computer, NEC
Segal, Z. ARC/Lum, H.

NCA 2-300 Carnegie - Mellon University 5240
Optical processing for terrain analysis
Period Obligations
04/15/88-04/14/90 FY89: \$40,000 TOTAL: \$80,000
Prin. Invest. NASA Tech. Officer CASE Category
Casasent, D. ARC/Ochoa, E. 22-Computer Science

NCC 2-463 Carnegie - Mellon University 5241
Machine learning and planning in reactive environments
Period Obligations
03/01/87-04/15/89 FY89: \$78,417 TOTAL: \$498,417
Prin. Invest. NASA Tech. Officer CASE Category
Mitchell, T. ARC/Friedland, P. E. 22-Computer Science
Mason, M. ARC/Bull, J. S.
Carbonell, J.

NCC 2-531 Carnegie - Mellon University 5242
The generalization of constraint based scheduling theories with applications to space telescope observation scheduling
Period Obligations
01/01/88-10/31/89 FY89: \$304,305 TOTAL: \$450,454
Prin. Invest. NASA Tech. Officer CASE Category
Smith, S. F. ARC/Rosenthal, D. A. 22-Computer Science

NGT 00-050-423 Carnegie - Mellon University 5243
NASA graduate student researchers program
Period Obligations
08/01/89-07/31/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Shafer, S. A. HQ-XE/Owens, F. C. 21-Mathematics

NGT 00-050-436 Carnegie - Mellon University 5244
NASA graduate student researchers program
Period Obligations
09/01/89-08/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Chyu, M. K. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 00-050-474 Carnegie - Mellon University 5245
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Segall, Z. HQ-XE/Owens, F. C. 45-Elec Engr

NAG 1-708 Drexel University 5246
Surface interface and structural properties of II VI compounds and their pseudobinary alloys
Period Obligations
11/07/86-10/31/89 FY89: TOTAL: \$205,000
Prin. Invest. NASA Tech. Officer CASE Category
Bose, S. M. LARC/Clark, I. O. 19-Phys Sci, NEC
LARC/Miller, W. E.

NAG 1-926 Drexel University 5247
Determination of atmospheric sulfur gas by isotopic dilution gas chromatography mass spectrometry and cryogenic enrichment on chemical instrumentation test and evaluation 3 cite-3
Period Obligations
11/01/88-10/31/90 FY89: \$206,000 TOTAL: \$206,000
Prin. Invest. NASA Tech. Officer CASE Category
Bandy, A. R. LARC/Bendura, R. J. 31-Atmos Sci
Thornton, D. C. LARC/Hoell, J. M.

NAG 1-927 Drexel University 5248
Sulfur gas measurements by gas chromatography with flame photometric detection GC FPD
Period Obligations
11/01/88-10/31/90 FY89: \$177,000 TOTAL: \$177,000
Prin. Invest. NASA Tech. Officer CASE Category
Thornton, D. C. LARC/Drewry, J. W. 31-Atmos Sci
LARC/Hoell, J. M.

NAG 3-1059 Drexel University 5249
Development of improved hypersonic engine seals
Period Obligations
07/01/89-06/30/90 FY89: \$80,000 TOTAL: \$80,000
Prin. Invest. NASA Tech. Officer CASE Category
Ko, F. K. LERC/Steinetz, B. M. 46-Mech Engr
Mutharason, R.
Pastore, P.

NASA'S UNIVERSITY PROGRAM
PENNSYLVANIA (Continued)

NAG 8-687 Drexel University 5250
The impact of thermodynamic data on mesoscale precipitation simulations
Period Obligations
09/28/87-06/02/88 FY89: TOTAL: \$38,477
Prin. Invest. NASA Tech. Officer CASE Category
Perkey, D. J. MSFC/Robertson, F. 31-Atmos Sci

NAG 8-714 Drexel University 5251
The impact of thermodynamic data on mesoscale precipitation simulations
Period Obligations
05/01/88-05/01/90 FY89: \$50,000 TOTAL: \$114,990
Prin. Invest. NASA Tech. Officer CASE Category
Perkey, D. J. MSFC/Robertson, F. 31-Atmos Sci

NAGW 737 Drexel University 5252
Far infrared thermal emission spectroscopy of the stratosphere for measurement of temperature and trace gas distributions
Period Obligations
04/01/85-03/31/89 FY89: TOTAL: \$153,897
Prin. Invest. NASA Tech. Officer CASE Category
Perkey, D. J. HQ-EE/Kurylo, M. J. 31-Atmos Sci
HQ-EE/Margitan, J. J.

NAS 1-18154 Drexel University 5253
Earth radiation budget experiment (ERBE)
Period Obligations
09/18/85-09/18/90 FY89: \$67,600 TOTAL: \$311,600
Prin. Invest. NASA Tech. Officer CASE Category
House, F. B. LARC/Cooper, J. E. 31-Atmos Sci

NCC 1-138 Drexel University 5254
Unit cell geometry of complex preforms for structural composites
Period Obligations
05/01/89-04/30/90 FY89: \$24,605 TOTAL: \$24,605
Prin. Invest. NASA Tech. Officer CASE Category
Pastore, C. M. LARC/Dexter, H. B. 47-Materials Engr
Ko, F. K. LARC/Whitcomb, J. D.

NCC 3-84 Drexel University 5255
Optically controlled phased array studies
Period Obligations
04/30/87-12/31/89 FY89: TOTAL: \$93,201
Prin. Invest. NASA Tech. Officer CASE Category
Herczfeld, P. R. LERC/Kunath, R. R. 45-Elec Engr
Daryoush, A. S.
Kam, M.

NCC 3-113 Drexel University 5256
Fiber optic links for millimeter wave phased array antennas
Period Obligations
07/14/88-07/14/89 FY89: TOTAL: \$30,000
Prin. Invest. NASA Tech. Officer CASE Category
Daryoush, A. S. LERC/Kunath, R. R. 45-Elec Engr

NCC 3-149 Drexel University 5257
Fiber optic links for millimeter wave phased array antennas in communication satellites II
Period Obligations
09/15/89-09/14/90 FY89: \$45,000 TOTAL: \$45,000
Prin. Invest. NASA Tech. Officer CASE Category
Daryoush, A. S. LERC/Kunath, R. R. 45-Elec Engr

NAG 5-641 Indiana University of Pennsylvania 5258
Enhancements for the airborne oceanographic lidar
Period Obligations
01/15/87-05/14/88 FY89: TOTAL: \$34,792
Prin. Invest. NASA Tech. Officer CASE Category
Berry, R. E. GSFC/Hoge, F. E. 33-Oceanography

NAG 5-650 Indiana University of Pennsylvania 5259
Enhancements for the airborne oceanographic lidar
Period Obligations
07/01/88-06/30/89 FY89: TOTAL: \$4,290
Prin. Invest. NASA Tech. Officer CASE Category
Berry, R. E. GSFC/Hoge, F. E. 33-Oceanography
GSFC/Krabill, W. B.

NAG 1-713 Lehigh University 5260
Crack problems in orthotropic plates and nonhomogeneous materials
Period Obligations
11/01/86-11/30/89 FY89: \$40,000 TOTAL: \$115,000
Prin. Invest. NASA Tech. Officer CASE Category
Erdogan, F. LARC/Bigelow, C. A. 46-Mech Engr
LARC/Poe, C. C.

NAG 1-832 Lehigh University 5261
Embedded function methods for compressible high speed turbulent flow
Period Obligations
01/01/88-01/31/90 FY89: \$60,000 TOTAL: \$160,000
Prin. Invest. NASA Tech. Officer CASE Category
Walker, J. D. LARC/Kumar, A. 41-Aero Engr
LARC/Rudy, D. H.

NAG 3-709 Lehigh University 5262
Prototype CARS spectrometer using advanced solid state detectors
Period Obligations
03/15/86-06/30/90 FY89: TOTAL: \$180,000
Prin. Invest. NASA Tech. Officer CASE Category
Thompson, E. D. LERC/Piltch, N. D. 13-Physics
Deen, M. J.

NAG 3-771 Lehigh University 5263
Heat transfer in three dimensional turbulent boundary layers
Period Obligations
01/01/87-01/28/90 FY89: \$40,000 TOTAL: \$120,000
Prin. Invest. NASA Tech. Officer CASE Category
Walker, J. D. LERC/Simon, F. 41-Aero Engr
LERC/Hippensteele, S. A.

NAG 9-45 Lehigh University 5264
Shock and thermal history of iron and chondritic meteorites
Period Obligations
04/01/83-04/01/90 FY89: \$119,635 TOTAL: \$700,635
Prin. Invest. NASA Tech. Officer CASE Category
Goldstein, J. I. JSC/Browne, I. D. 47-Materials Engr
Williams, D. B.
Sellamuthu, R.

NAS 8-32951 Lehigh University 5265
Experiment for materials processing in space production of large particle size monodisperse latexes
Period Obligations
02/22/78-01/29/89 FY89: TOTAL: \$1,139,162
Prin. Invest. NASA Tech. Officer CASE Category
Vanderhoff, J. W. MSFC/Bannett, B. 51-Biological Sci
MSFC/Kornfield, D. M.

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PENNSYLVANIA (Continued)**

NAS 8-36286 Lehigh University 5266
Preparation of styrene latex particles in a rotating reactor
Period Obligations
11/28/84-09/30/89 FY89: TOTAL: \$257,318
Prin Invest NASA Tech Officer CASE Category
Vandentoff, J. W. MSFC/Kornfeld, D. M. 43-Chem Engr
Elaasser, M. S. MSFC/Snyder, R. S.

NCA 2-293 Lehigh University 5267
Infrared intensities of chlorine nitrate
Period Obligations
04/01/88-06/01/90 FY89: TOTAL: \$7,320
Prin Invest NASA Tech Officer CASE Category
Lovejoy, R. ARC/Chackerian, C. 11-Astronomy

NGT 00-050-417 Lehigh University 5268
NASA graduate student researchers program
Period Obligations
08/01/89-07/31/90 FY89: \$18,000 TOTAL: \$18,000
Prin Invest NASA Tech Officer CASE Category
Wood, J. D. HQ-XE/Owens, F. C. 47-Materials Engr

NSG 5386 Lehigh University 5269
Mass flow and evolution in close binaries including simultaneous observations of X-ray binaries
Period Obligations
07/01/79-07/31/90 FY89: TOTAL: \$180,186
Prin Invest NASA Tech Officer CASE Category
McCluskey, G. E. GSFC/Kondo, Y. 11-Astronomy
Kondo, Y.

NAS 5-28566 Lincoln University - Pa. 5270
Development of computer-aided medical information management systems
Period Obligations
10/01/84-03/24/90 FY89: \$50,000 TOTAL: \$891,168
Prin Invest NASA Tech Officer CASE Category
Frankowsk, J. W. GSFC/Alterescu, S. 22-Computer Science

NCA 5-98 Lincoln University - Pa. 5271
Introduction aerospace engineering
Period Obligations
07/01/80-06/30/88 FY89: TOTAL: \$387,664
Prin Invest NASA Tech Officer CASE Category
Williams, W. W. GSFC/Menchan, D. 49-Engr, NEC

NGT 00-090-020 Lincoln University - Pa. 5272
Lincoln advanced science and engineering reinforcement program laser
Period Obligations
07/01/88-06/30/90 FY89: \$90,000 TOTAL: \$150,000
Prin Invest NASA Tech Officer CASE Category
Williams, W. HQ-U/Freeman, Y. B. 49-Engr, NEC

NCA 2-202 Pennsylvania College of Optometry 5273
Low vision project
Period Obligations
03/09/87-06/08/89 FY89: TOTAL: \$80,000
Prin Invest NASA Tech Officer CASE Category
Whittaker, S. ARC/Fisher, S. 69-Psych, NEC
Higgins, K. ARC/Larimer, J.

NAG 9-118 Pennsylvania State Univ - Hershey Med. 5274
Vection induced gastric dysrhythmias in motion sickness
Period Obligations
05/01/85-01/01/90 FY89: \$170,000 TOTAL: \$465,176
Prin Invest NASA Tech Officer CASE Category
Koch, K. JSC/Kutyna, F. A. 56-Medical Sciences
Stern, R. M.

NCC 2-127 Pennsylvania State Univ - Hershey Med. 5275
Effect of cerebral-spinal fluid hormonal and ionic composition on salt/water metabolism
Period Obligations
03/01/81-02/28/90 FY89: \$49,860 TOTAL: \$359,450
Prin Invest NASA Tech Officer CASE Category
Severs, W. B. ARC/Keil, L. 51-Biological Sci

NGT 00-070-035 Pennsylvania State Univ - Hershey Med. 5276
Graduate student researchers underrepresented minority focus program
Period Obligations
08/01/87-07/31/89 FY89: \$18,000 TOTAL: \$36,000
Prin Invest NASA Tech Officer CASE Category
Severs, W. B. HQ-XE/Owens, F. C. 12-Chemistry

NAG 1-652 Pennsylvania State Univ. - Univ. Park 5277
Low cloud investigations for project fire: Island studies of cloud properties, surface radiation, and boundary layer dynamics
Period Obligations
03/07/86-03/06/90 FY89: \$42,000 TOTAL: \$149,364
Prin Invest NASA Tech Officer CASE Category
Fairall, C. W. LARC/McDougal, D. S. 31-Atmos Sci
LARC/Owens, T. L.

NAG 1-657 Pennsylvania State Univ. - Univ. Park 5278
Reynolds stress closure in jet flows using wave models
Period Obligations
03/01/86-02/28/90 FY89: \$63,816 TOTAL: \$267,688
Prin Invest NASA Tech Officer CASE Category
Morris, P. J. LARC/Seiner, J. M. 41-Aero Engr
LARC/Henderson, W. P.

NAG 1-778 Pennsylvania State Univ. - Univ. Park 5279
A computationally efficient modelling of laminar separation bubbles
Period Obligations
06/04/87-10/03/89 FY89: \$20,000 TOTAL: \$127,195
Prin Invest NASA Tech Officer CASE Category
Maughmer, M. D. LARC/Somers, D. M. 41-Aero Engr

NAG 1-849 Pennsylvania State Univ. - Univ. Park 5280
Prediction of forces and moments for flight vehicle control effectors
Period Obligations
02/15/88-09/30/89 FY89: \$28,379 TOTAL: \$108,892
Prin Invest NASA Tech Officer CASE Category
Maughmer, M. D. LARC/Shaugnessy, J. D. 41-Aero Engr

NAG 1-872 Pennsylvania State Univ. - Univ. Park 5281
Supersonic mixing enhancement by vortex bursting for high speed propulsion
Period Obligations
04/01/88-03/31/90 FY89: \$75,000 TOTAL: \$150,000
Prin Invest NASA Tech Officer CASE Category
Settles, G. S. LARC/Northam, G. B. 41-Aero Engr
LARC/Barnwell, D.

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NAG 1-947 Pennsylvania State Univ. - Univ. Park 5282
 Atmosphere effects on sonic booms from aircraft designs for minimal booms

<i>Period</i>	<i>Obligations</i>	
01/15/89-10/14/89	FY89: \$38,190	TOTAL: \$38,190
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Pierce, A. D.	LARC/McAninch, G.	13-Physics
	LARC/Preisser, J. S.	

NAG 1-969 Pennsylvania State Univ. - Univ. Park 5283
 Novel contribution to robust controller design for large flexible space structures LFSS

<i>Period</i>	<i>Obligations</i>	
02/01/89-01/31/90	FY89: \$40,103	TOTAL: \$40,103
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Bose, N. K.	LARC/Joshi, S. M.	45-Elec Engr

NAG 1-982 Pennsylvania State Univ. - Univ. Park 5284
 Structural design criteria for filament-wound composite shells

<i>Period</i>	<i>Obligations</i>	
05/15/89-05/14/90	FY89: \$80,000	TOTAL: \$80,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hahn, H. T.	LARC/Starnes, J. H.	41-Aero Engr
Jensen, D. W.		

NAG 1-999 Pennsylvania State Univ. - Univ. Park 5285
 Radiation and microphysics in cirrus and marine stratocumulus clouds

<i>Period</i>	<i>Obligations</i>	
05/09/89-05/08/90	FY89: \$50,000	TOTAL: \$50,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Ackerman, T. P.	LARC/McDougal, D. S.	31-Atmos Sci
	LARC/Owens, T. L.	

NAG 1-1012 Pennsylvania State Univ. - Univ. Park 5286
 System study of the hybrid plume plasma rocket

<i>Period</i>	<i>Obligations</i>	
06/01/89-05/31/90	FY89: \$33,639	TOTAL: \$33,639
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Micci, M. M.	LARC/Conway, E. J.	42-Astro Engr
	LARC/Meador, W. E.	

NAG 1-1047 Pennsylvania State Univ. - Univ. Park 5287
 The aeroacoustics of supersonic jet

<i>Period</i>	<i>Obligations</i>	
08/15/89-09/30/89	FY89: \$19,095	TOTAL: \$19,095
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Morris, P. J.	LARC/Seiner, J. M.	41-Aero Engr
McLaughlin, D. K.	LARC/Preisser, J. S.	

NAG 1-1057 Pennsylvania State Univ. - Univ. Park 5288
 In-situ detection of tropospheric OH, HO₂, NO₂, and NO by laser induced fluorescence in detection chambers at reduced pressures

<i>Period</i>	<i>Obligations</i>	
10/01/89-09/30/90	FY89: \$128,150	TOTAL: \$128,150
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Brune, W. H.	LARC/Hoell, J. M.	31-Atmos Sci
	LARC/Bendura, R. J.	

NAG 2-484 Pennsylvania State Univ. - Univ. Park 5289
 The flow instability associated with a ground vortex

<i>Period</i>	<i>Obligations</i>	
01/01/87-10/31/89	FY89: \$55,000	TOTAL: \$124,250
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Cimbala, J. M.	ARC/Bellavia, D.	41-Aero Engr
Billet, M. L.		

NAG 2-565 Pennsylvania State Univ. - Univ. Park 5290
 Hypersonic database collection and assessment

<i>Period</i>	<i>Obligations</i>	
11/01/88-10/31/89	FY89: \$75,000	TOTAL: \$75,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Settles, G. S.	ARC/Horstman, C. C.	41-Aero Engr
	ARC/Marvin, J. G.	

NAG 2-575 Pennsylvania State Univ. - Univ. Park 5291
 Supersonic shock wave vortex interaction

<i>Period</i>	<i>Obligations</i>	
04/01/89-03/31/90	FY89: \$60,000	TOTAL: \$60,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Settles, G. S.	ARC/Horstman, C. C.	41-Aero Engr
	ARC/Marvin, J. G.	

NAG 2-592 Pennsylvania State Univ. - Univ. Park 5292
 Swept shock/boundary layer interaction experiments in support of CFD code validation

<i>Period</i>	<i>Obligations</i>	
01/15/89-01/14/90	FY89: \$50,000	TOTAL: \$50,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Settles, G. S.	ARC/Horstman, C. C.	41-Aero Engr
	ARC/Marvin, J. G.	

NAG 2-598 Pennsylvania State Univ. - Univ. Park 5293
 Preflight and flight experiment for pituitary gland study of Cosmos, 1989

<i>Period</i>	<i>Obligations</i>	
06/01/89-10/31/89	FY89: \$12,000	TOTAL: \$12,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hymer, W. C.	ARC/Grindeland, R. E.	56-Medical Sciences

NAG 2-599 Pennsylvania State Univ. - Univ. Park 5294
 Cosmos 1989 lymphocyte studies

<i>Period</i>	<i>Obligations</i>	
06/01/89-10/31/89	FY89: \$7,000	TOTAL: \$7,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Mastro, A. M.	ARC/Grindeland, R. E.	56-Medical Sciences

NAG 3-555 Pennsylvania State Univ. - Univ. Park 5295
 3-D flow field in a turbine nozzle and rotor blade rows

<i>Period</i>	<i>Obligations</i>	
12/01/84-11/27/89	FY89: \$60,000	TOTAL: \$343,328
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Lakshminarayana, B.	LERC/Civinsras, K. C.	41-Aero Engr
	LARC/Schwab, J. R.	

NAG 3-668 Pennsylvania State Univ. - Univ. Park 5296
 Kinetics and mechanism of foot formation in hydrocarbon combustion

<i>Period</i>	<i>Obligations</i>	
01/30/86-05/29/89	FY89:	TOTAL: \$86,079
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Frenklach, M.	LERC/Lezberg, E. A.	12-Chemistry
	LERC/Rabinowitz, M. J.	

NAG 3-823 Pennsylvania State Univ. - Univ. Park 5297
 Integrated control systems for advanced aircraft analysis simulation and experimentation

<i>Period</i>	<i>Obligations</i>	
09/25/87-09/30/89	FY89:	TOTAL: \$80,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Ray, A.	LERC/Delaat, J. C.	46-Mech Engr

**NASA'S UNIVERSITY PROGRAM
PENNSYLVANIA (Continued)**

NAG 3-827 Pennsylvania State Univ. - Univ. Park 5298
Ni Al alloys for structural uses
Period *Obligations*
10/25/87-10/25/89 FY89: \$49,586 TOTAL: \$99,243
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Koss, D. A. LERC/Nathal, M. V. 47-Materials Engr

NAG 3-949 Pennsylvania State Univ. - Univ. Park 5299
Active vibration isolation algorithm to maintain microgravity environment in space station
Period *Obligations*
11/01/88-12/15/89 FY89: \$62,252 TOTAL: \$62,252
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Singha, A. LERC/Grodsindky, C. M. 46-Mech Engr
LERC/Brown, G.

NAG 3-966 Pennsylvania State Univ. - Univ. Park 5300
Laser ignition with varying degrees of propellant mixing
Period *Obligations*
01/01/89-12/31/89 FY89: \$20,000 TOTAL: \$20,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Santavicca, D. A. LERC/Armstrong, E. S. 49-Engr, NEC

NAG 3-989 Pennsylvania State Univ. - Univ. Park 5301
Liquid crystal based digital image processing technique
Period *Obligations*
01/25/89-01/24/90 FY89: \$21,490 TOTAL: \$21,490
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Camci, C. LERC/Hippensteele, S. A. 46-Mech Engr
LERC/Spuckler, C. M.

NAG 3-991 Pennsylvania State Univ. - Univ. Park 5302
Chemical kinetics of our propulsion
Period *Obligations*
02/15/89-02/14/90 FY89: \$51,604 TOTAL: \$51,604
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Frenklach, M. Y. LERC/Rabinowitz, M. J. 12-Chemistry
LERC/Lezberg, E. A.

NAG 3-1020 Pennsylvania State Univ. - Univ. Park 5303
Flowfield analysis of low Reynolds number rocket engines
Period *Obligations*
03/13/89-03/12/90 FY89: \$74,422 TOTAL: \$74,422
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Merkle, C. L. LERC/Penko, P. F. 41-Aero Engr

NAG 3-1044 Pennsylvania State Univ. - Univ. Park 5304
Ignition and combustion characteristics of metallized propellants
Period *Obligations*
06/01/89-05/31/92 FY89: \$73,004 TOTAL: \$73,004
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Turns, S. R. LERC/Aukerman, C. A. 46-Mech Engr

NAG 3-1052 Pennsylvania State Univ. - Univ. Park 5305
Analysis foil bearings for high speed operations in cryogenic applications
Period *Obligations*
06/01/89-09/01/90 FY89: \$63,000 TOTAL: \$63,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Carpino, M. LERC/Walker, J. F. 46-Mech Engr

NAG 5-100 Pennsylvania State Univ. - Univ. Park 5306
High angular resolution X-ray and X-ray ultraviolet astronomy observations
Period *Obligations*
10/01/80-09/30/89 FY89: \$351,574 TOTAL: \$2,820,807
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Garmie, G. P. GSFC/Early, L. J. 11-Astronomy
GSFC/Pless, R. H.

NAG 5-303 Pennsylvania State Univ. - Univ. Park 5307
Atmospheric collisional broadening motional narrowing and shifting
Period *Obligations*
03/15/83-12/31/88 FY89: TOTAL: \$177,653
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Herman, R. H. GSFC/Susskind, J. 31-Atmos Sci

NAG 5-361 Pennsylvania State Univ. - Univ. Park 5308
Photometry of diffuse sources with wide-field cameras
Period *Obligations*
08/15/83-12/31/89 FY89: TOTAL: \$127,867
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Usher, P. D. GSFC/Klinglesmith, D. A. 11-Astronomy

NAG 5-563 Pennsylvania State Univ. - Univ. Park 5309
Coordinated observations of rational modulation in long period binary systems
Period *Obligations*
07/01/85-09/30/90 FY89: TOTAL: \$44,800
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Ramsey, L. W. GSFC/Kondo, Y. 11-Astronomy
Barden, S. C.

NAG 5-643 Pennsylvania State Univ. - Univ. Park 5310
Optimization of balloon film toughness
Period *Obligations*
04/01/87-09/30/89 FY89: TOTAL: \$422,276
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Harrison, I. R. GSFC/Smith, I. S. 99-Multi-Discip
Hunt, J. P. GSFC/Needleman, H. C.

NAG 5-644 Pennsylvania State Univ. - Univ. Park 5311
Development of an understanding of balloon film sealing from a materials prospective
Period *Obligations*
04/01/87-05/31/88 FY89: TOTAL: \$93,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hunt, J. P. GSFC/Smith, I. S. 99-Multi-Discip
GSFC/Needleman, H. C.

NAG 5-654 Pennsylvania State Univ. - Univ. Park 5312
Uncertainties in measurements of atmospheric structure and their role in rocoz a ozone intercomparisons
Period *Obligations*
12/01/88-09/30/89 FY89: \$36,307 TOTAL: \$36,307
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Olivero, J. J. GSFC/Parsons, C. L. 31-Atmos Sci

NAG 5-798 Pennsylvania State Univ. - Univ. Park 5313
Advanced data structure for the interpretation of image and cartographic data
Period *Obligations*
07/01/86-10/31/88 FY89: TOTAL: \$45,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Peuquet, D. J. GSFC/Campbell, W. J. 22-Computer Science
GSFC/Short, N., Jr.

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NAG 5-919 Pennsylvania State Univ. - Univ. Park 5314
 Evaluation and improvement of a method for estimating soil moisture from infrared satellite surface temperature measurements

Period	Obligations	
06/15/87-06/14/90	FY89: \$50,000	TOTAL: \$184,525
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Carlson, T. N.	GSFC/Oseroff, H.	19-Phys Sci, NEC

NAG 5-941 Pennsylvania State Univ. - Univ. Park 5315
 Analysis of soft diffuse X ray emission data

Period	Obligations	
07/01/87-10/31/89	FY89: \$32,000	TOTAL: \$67,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Garmire, G. P.	GSFC/Bullock, G. D.	19-Phys Sci, NEC

NAG 5-997 Pennsylvania State Univ. - Univ. Park 5316
 Rapid overlay of multisource spatial data

Period	Obligations	
09/01/87-12/31/88	FY89:	TOTAL: \$25,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Peuquet, D. J.	GSFC/McDonald, K. R.	22-Computer Science
	GSFC/Campbell, W. J.	

NAG 5-1107 Pennsylvania State Univ. - Univ. Park 5317
 Abundance anomalies of carbon and nitrogen in IUE spectra of algae type interacting binaries

Period	Obligations	
11/01/88-10/31/90	FY89: \$8,694	TOTAL: \$8,694
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
McCluskey, C.	GSFC/Kondo, Y.	11-Astronomy

NAG 5-1133 Pennsylvania State Univ. - Univ. Park 5318
 Regional climate change predictions from the high resolution general circulation model

Period	Obligations	
05/15/89-05/14/90	FY89: \$49,326	TOTAL: \$49,326
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Crane, R. G.	GSFC/Rind, D.	31-Atmos Sci

NAG 5-1211 Pennsylvania State Univ. - Univ. Park 5319
 Statistical algorithms for handling low count per bin datasets

Period	Obligations	
08/01/89-07/31/90	FY89: \$18,173	TOTAL: \$18,173
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Nousek, J.	GSFC/West, D.	11-Astronomy

NAG 5-1212 Pennsylvania State Univ. - Univ. Park 5320
 Search for X-ray emitting young stars outside of massive molecular clouds

Period	Obligations	
08/01/89-12/31/89	FY89: \$17,000	TOTAL: \$17,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Feigelson, E. D.	GSFC/West, D.	11-Astronomy

NAG 6-7 Pennsylvania State Univ. - Univ. Park 5321
 Investigate the influence of auroral energetic and electrodynamic coupling on middle atmosphere parameters

Period	Obligations	
09/01/80-11/30/89	FY89: \$143,802	TOTAL: \$609,262
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Mitchell, J. D.	GSFC/Early, L. J.	19-Phys Sci, NEC
Maynard, N. C.	GSFC/Pless, R. H.	
Goldberg, R. A.		

NAG 8-601 Pennsylvania State Univ. - Univ. Park 5322
 Search for shadowing by the SMC

Period	Obligations	
07/01/86-06/30/89	FY89:	TOTAL: \$19,612
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Burrows, D.	MSFC/Potter, P. V.	11-Astronomy

NAG 8-672 Pennsylvania State Univ. - Univ. Park 5323
 X ray and IR emission of AGNS

Period	Obligations	
09/01/87-03/01/89	FY89:	TOTAL: \$19,801
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Meszaros, P. I.	MSFC/Harper, B.	11-Astronomy

NAG 8-754 Pennsylvania State Univ. - Univ. Park 5324
 Examination of wind profiler data from Kennedy Space Flight Center

Period	Obligations	
11/01/88-10/31/89	FY89: \$61,364	TOTAL: \$61,364
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Forbes, G. S.	MSFC/Carlson, C. A.	31-Atmos Sci
Syrett, W.	MSFC/Hill, C. K.	

NAG 8-758 Pennsylvania State Univ. - Univ. Park 5325
 Final archiving of HEAO 1 data products and software

Period	Obligations	
01/01/89-12/31/89	FY89: \$71,330	TOTAL: \$71,330
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Nousek, J. A.	MSFC/Havrisik, D.	11-Astronomy

NAG 8-775 Pennsylvania State Univ. - Univ. Park 5326
 An analytical formulation for a design technology for multiphase structures

Period	Obligations	
05/01/89-04/30/90	FY89: \$62,941	TOTAL: \$62,941
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Salamon, N. J.	MSFC/Kublin, T. V.	47-Materials Engr
	MSFC/Stucker, M. L.	

NAG 8-780 Pennsylvania State Univ. - Univ. Park 5327
 Stratiform clouds and their interaction with atmospheric motions

Period	Obligations	
06/15/89-06/14/92	FY89: \$54,000	TOTAL: \$54,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Clark, J.	MSFC/Kaufman, J. W.	31-Atmos Sci
Dutton, J. A.	MSFC/Leslie, F. W.	
Shirer, H. N.		

NAG 9-379 Pennsylvania State Univ. - Univ. Park 5328
 The simulation of zero gravity locomotion

Period	Obligations	
06/01/89-06/01/90	FY89: \$74,250	TOTAL: \$74,250
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Cavanagh, P. R.	JSC/Schneider, V.	32-Geological Sci

NAGW 994 Pennsylvania State Univ. - Univ. Park 5329
 Interaction of a coastal front and development cyclones using land and ocean surface data as well as atmospheric

Period	Obligations	
11/01/86-10/31/89	FY89: \$70,000	TOTAL: \$200,982
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Warner, T. T.	HQ-EE/Dodge, J. C.	31-Atmos Sci
	HQ-EE/Tuyahov, A. J.	

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NAGW 1042 Pennsylvania State Univ. - Univ. Park 5330
Synoptic analysis of ice melts
Period *Obligations*
01/01/87-06/30/89 FY89: TOTAL: \$84,210
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Crane, R. G. HQ-EE/Thomas, R. H. 33-Oceanography
HQ-EE/Wilson, W. S.

NAGW 1196 Pennsylvania State Univ. - Univ. Park 5331
A center for the commercial development of space
Period *Obligations*
10/01/87-10/31/89 FY89: \$1,293,400 TOTAL: \$2,363,200
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hymer, W. HQ-IC/Oran, W. A. 99-Multi-Discip
Maestro, A. HQ/Whitten, R. P.

NAGW 1302 Pennsylvania State Univ. - Univ. Park 5332
Interim support for microwave measurements of mesospheric water vapor at Penn State
Period *Obligations*
03/01/88-03/31/90 FY89: \$218,629 TOTAL: \$252,670
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Olivero, J. HQ-EE/Kurylo, M. J. 31-Atmos Sci
Croskey, C. HQ-EE/Luther, M.

NAGW 1356 Pennsylvania State Univ. - Univ. Park 5333
NASA center for space propulsion engineering a university space engineering research center
Period *Obligations*
06/01/88-02/28/90 FY89: \$1,300,000 TOTAL: \$1,800,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Merkle, C. L. HQ-RP/Vanlandingham, E. E. 49-Engr, NEC

NAGW 1381 Pennsylvania State Univ. - Univ. Park 5334
Advanced high temperature composite materials for engine applications
Period *Obligations*
07/01/88-06/30/90 FY89: \$800,000 TOTAL: \$800,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Tressler, R. E. HQ-RM/Quigley, B. F. 47-Materials Engr
Hellman, J. R. HQ-RM/Crooker, T. W.
Hahn, H. T.

NAGW 1430 Pennsylvania State Univ. - Univ. Park 5335
A proposal for computer equipment
Period *Obligations*
02/01/88-01/31/89 FY89: TOTAL: \$200,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Warner, T. T. HQ-EE/Tuyahov, A. J. 39-Env Sci, NEC

NAGW 1434 Pennsylvania State Univ. - Univ. Park 5336
Predictability of a coupled atmosphere-ocean system
Period *Obligations*
08/15/88-08/19/89 FY89: TOTAL: \$13,554
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Dutton, J. A. HQ-EE/Kakar, R. K. 31-Atmos Sci
HQ-EE/Theon, J. S.

NAGW 1465 Pennsylvania State Univ. - Univ. Park 5337
Support of the Harvard C10/bro instrument for the preparation execution and data review for the arctic FORTEx mission
Period *Obligations*
09/15/88-03/14/90 FY89: \$53,548 TOTAL: \$53,548
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Brune, W. H. HQ-EE/Kurylo, M. J. 31-Atmos Sci
HQ-EE/Watson, R. T.

NAGW 1522 Pennsylvania State Univ. - Univ. Park 5338
High energy compact sources and radiation backgrounds
Period *Obligations*
12/01/88-11/30/89 FY89: \$52,000 TOTAL: \$52,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Meszaros, P. I. HQ-EZ/Kaluzienski, L. J. 11-Astronomy
HQ-EZ/Bunner, A. N.

NAGW 1713 Pennsylvania State Univ. - Univ. Park 5339
Provide scientific and managerial support to the astrophysics master directory working group
Period *Obligations*
01/01/89-12/31/89 FY89: \$21,522 TOTAL: \$21,522
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Nousek, J. HQ-EZ/Weiss, J. R. 11-Astronomy
HQ-EZ/Riegler, G. R.

NAGW 10-39 Pennsylvania State Univ. - Univ. Park 5340
Mechanism of differential growth in plants
Period *Obligations*
11/01/86-10/31/89 FY89: \$50,000 TOTAL: \$143,607
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Cosgrove, D. J. KSC/Knott, W. 39-Env Sci, NEC

NAGW 10-59 Pennsylvania State Univ. - Univ. Park 5341
Measurement of the light flux density patterns from luminaires proposed as photon sources for photosynthesis during space travel
Period *Obligations*
07/01/89-12/31/90 FY89: \$20,122 TOTAL: \$20,122
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Walker, P. N. KSC/Sager, J. S. 49-Engr, NEC

NAS 5-30556 Pennsylvania State Univ. - Univ. Park 5342
EOS interdisciplinary study
Period *Obligations*
09/06/89-12/14/90 FY89: \$41,500 TOTAL: \$41,500
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Barron, E. GSFC/Soffen, G. 33-Oceanography

NAS 8-36194 Pennsylvania State Univ. - Univ. Park 5343
Research study entitled infrared back scattering properties of the atmospheric aerosol: Variations in time and space
Period *Obligations*
03/27/85-08/31/89 FY89: TOTAL: \$110,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bohren, C. F. MSFC/Alexander, M. B. 19-Phys Sci, NEC
MSFC/Fitzjarrald, D. E.

NAS 8-36749 Pennsylvania State Univ. - Univ. Park 5344
AXAF CCD imaging spectrometer (ACIS)
Period *Obligations*
01/15/86-12/31/89 FY89: \$1,226,000 TOTAL: \$4,859,900
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Garmire, G. P. MSFC/Cummings, N. P. 11-Astronomy

NAS 9-17416 Pennsylvania State Univ. - Univ. Park 5345
Study to develop new continuous flow electrophoresis flight experiments to repeat the pituitary cell separation and hormone secretion experiments conducted on STS 8
Period *Obligations*
12/01/84-12/01/89 FY89: \$30,000 TOTAL: \$430,900
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hymer, W. JSC/Morrison, D. 56-Medical Sciences

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NAS 9-17431 Pennsylvania State Univ. - Univ. Park 5346
 Kidney cell electrophoresis in microgravity
Period Obligations
 05/01/85-02/01/90 FY89: TOTAL: \$221,900
Prin Invest NASA Tech. Officer CASE Category
 Todd, P. JSC/Morrison, D. 59-Life Sci, NEC

NCA 2-100 Pennsylvania State Univ. - Univ. Park 5347
 Generation of solution adaptive three-dimensional computational grids using optimization
Period Obligations
 03/01/86-08/31/88 FY89: TOTAL: \$30,000
Prin Invest NASA Tech. Officer CASE Category
 Dulikravich, G. S. ARC/Mehta, U. B. 41-Aero Engr

NCA 2-120 Pennsylvania State Univ. - Univ. Park 5348
 Physical modeling and computations of hypersonic flows
Period Obligations
 04/01/86-03/31/88 FY89: TOTAL: \$80,000
Prin Invest NASA Tech. Officer CASE Category
 Dulikravich, G. S. ARC/Feiereisen, W. J. 41-Aero Engr

NCA 2-192 Pennsylvania State Univ. - Univ. Park 5349
 An exploratory study of the secondary separation phenomenon in swept shock wave boundary layer interactions
Period Obligations
 01/15/87-01/14/89 FY89: TOTAL: \$80,000
Prin Invest NASA Tech. Officer CASE Category
 Settles, G. S. ARC/Horstman, C. C. 46-Mech Engr

NCA 2-235 Pennsylvania State Univ. - Univ. Park 5350
 Supersonic vortex bursting
Period Obligations
 07/01/87-06/30/89 FY89: TOTAL: \$80,000
Prin Invest NASA Tech. Officer CASE Category
 Settles, G. S. ARC/Horstman, C. C. 46-Mech Engr

NCA 2-291 Pennsylvania State Univ. - Univ. Park 5351
 Computational fluid dynamics of heart valves
Period Obligations
 02/01/88-01/31/90 FY89: \$36,122 TOTAL: \$70,088
Prin Invest NASA Tech. Officer CASE Category
 Tarbell, J. M. ARC/Kwak, D. 41-Aero Engr

NCA 2-335 Pennsylvania State Univ. - Univ. Park 5352
 Intercomparison of aircraft data and model results for mid-latitude cirrus clouds
Period Obligations
 06/01/88-04/30/89 FY89: TOTAL: \$25,000
Prin Invest NASA Tech. Officer CASE Category
 Ackerman, T. P. ARC/Pollack, J. B. 11-Astronomy
 ARC/Valero, F. P.

NCA 2-369 Pennsylvania State Univ. - Univ. Park 5353
 Atmospheric composition and climate on the early Earth
Period Obligations
 11/15/88-11/14/89 FY89: \$29,880 TOTAL: \$29,880
Prin Invest NASA Tech. Officer CASE Category
 Kasting, J. F. ARC/Pollack, J. B. 39-Env Sci, NEC

NCA 2-402 Pennsylvania State Univ. - Univ. Park 5354
 Radiation modelling and dissipation effects in hypersonic flow computations
Period Obligations
 05/01/89-04/30/91 FY89: \$25,000 TOTAL: \$25,000
Prin Invest NASA Tech. Officer CASE Category
 Dulikravich, G. S. ARC/Deiwert, G. S. 41-Aero Engr

NCC 2-370 Pennsylvania State Univ. - Univ. Park 5355
 Microgravity induced effect on pituitary growth hormone cell function: A mechanism for muscle atrophy in manned space flight
Period Obligations
 08/01/85-10/31/89 FY89: \$51,000 TOTAL: \$263,230
Prin Invest NASA Tech. Officer CASE Category
 Hymer, W. C. ARC/Winget, C. M. 51-Biological Sci
 Grindeland, R. E. ARC/Ballard, R. W.
 Morrison, D. R.

NCC 2-489 Pennsylvania State Univ. - Univ. Park 5356
 The effects of desert dust and forest fire smoke on atmospheric circulations and local climate
Period Obligations
 09/01/87-08/31/88 FY89: TOTAL: \$64,825
Prin Invest NASA Tech. Officer CASE Category
 Carlson, T. N. ARC/Toon, O. B. 31-Atmos Sci

NGL 39-009-003 Pennsylvania State Univ. - Univ. Park 5357
 Research on electron densities in upper ionosphere, including studies of rocket and separating capsule experimental techniques
Period Obligations
 03/01/61-06/20/89 FY89: \$140,000 TOTAL: \$3,447,767
Prin Invest NASA Tech. Officer CASE Category
 Nisbet, J. S. HQ-ES/Mellott, M. M. 13-Physics
 HQ-ES/Parks, G. K.

NGT 00-050-003 Pennsylvania State Univ. - Univ. Park 5358
 NASA graduate student researchers program
Period Obligations
 06/01/87-05/31/89 FY89: TOTAL: \$53,676
Prin Invest NASA Tech. Officer CASE Category
 Morris, P. J. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 00-050-135 Pennsylvania State Univ. - Univ. Park 5359
 NASA graduate student researchers program
Period Obligations
 06/01/87-05/31/88 FY89: TOTAL: \$18,000
Prin Invest NASA Tech. Officer CASE Category
 Dulikravich, G. S. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 00-050-265 Pennsylvania State Univ. - Univ. Park 5360
 NASA graduate student researchers program
Period Obligations
 09/01/88-08/31/90 FY89: TOTAL: \$18,000
Prin Invest NASA Tech. Officer CASE Category
 Koopmann, G. H. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 00-050-282 Pennsylvania State Univ. - Univ. Park 5361
 NASA graduate student researchers program
Period Obligations
 08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin Invest NASA Tech. Officer CASE Category
 Peterson, G. W. HQ-EE/Wickland, D. E. 39-Env Sci, NEC
 Jarvis, C. HQ-EE/Ruzek, M.

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NGT 00-050-309 Pennsylvania State Univ. - Univ. Park 5362
NASA graduate student researchers program
Period Obligations
08/01/88-07/31/90 FY89: \$17,998 TOTAL: \$35,951
Prin. Invest. NASA Tech. Officer CASE Category
Garmire, G. P. HQ-XE/Owens, F. C. 11-Astronomy

NGT 00-050-341 Pennsylvania State Univ. - Univ. Park 5363
NASA graduate student researchers program
Period Obligations
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Maughmer, M. D. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 00-050-393 Pennsylvania State Univ. - Univ. Park 5364
NASA graduate student researchers program
Period Obligations
12/01/88-08/21/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Heid, K. HQ-XE/Owens, F. C. 99-Multi-Discip

NGT 00-050-400 Pennsylvania State Univ. - Univ. Park 5365
NASA graduate student researchers program
Period Obligations
08/15/89-08/14/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Settles, G. S. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 00-050-410 Pennsylvania State Univ. - Univ. Park 5366
NASA graduate student researchers program
Period Obligations
08/15/89-08/14/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Varadan, V. V. HQ-XE/Owens, F. C. 49-Engr, NEC

NGT 00-050-495 Pennsylvania State Univ. - Univ. Park 5367
NASA graduate student researchers program
Period Obligations
08/15/89-08/14/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Settles, G. S. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 00-050-509 Pennsylvania State Univ. - Univ. Park 5368
NASA graduate student researchers program
Period Obligations
08/15/89-08/14/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Carlson, T. HQ-XE/Owens, F. C. 19-Phys Sci, NEC

NGT 00-070-044 Pennsylvania State Univ. - Univ. Park 5369
Graduate student researchers underrepresented minority focus program
Period Obligations
09/01/87-08/31/90 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Anderson, R. B. HQ-XE/Owens, F. C. 99-Multi-Discip

NGT 00-070-128 Pennsylvania State Univ. - Univ. Park 5370
NASA graduate student researchers underrepresented minority focus program
Period Obligations
06/01/89-05/31/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Stern, R. M. HQ-XE/Owens, F. C. 69-Psych, NEC

NGT 00-070-129 Pennsylvania State Univ. - Univ. Park 5371
NASA graduate student researchers program
Period Obligations
07/01/89-08/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Stern, R. M. HQ-XE/Owens, F. C. 69-Psych, NEC

NSG 3264 Pennsylvania State Univ. - Univ. Park 5372
The boundary layer on compressor cascade blades
Period Obligations
06/04/79-01/31/90 FY89: \$25,000 TOTAL: \$690,121
Prin. Invest. NASA Tech. Officer CASE Category
Deutsch, S. LERC/Sanger, N. L. 41-Aero Engr
Zierke, W. C.

NSG 3266 Pennsylvania State Univ. - Univ. Park 5373
Three dimensional flow field inside compressor rotor passages, including blade boundary layers
Period Obligations
06/26/79-11/28/89 FY89: \$40,500 TOTAL: \$553,191
Prin. Invest. NASA Tech. Officer CASE Category
Lakshminarayana, B. LERC/Sockol, P. M. 41-Aero Engr

NSG 6004 Pennsylvania State Univ. - Univ. Park 5374
Studies of mesospheric ionization
Period Obligations
10/01/75-12/31/89 FY89: \$80,000 TOTAL: \$1,082,664
Prin. Invest. NASA Tech. Officer CASE Category
Hale, L. C. GSFC/Early, L. J. 19-Phys Sci, NEC
GSFC/Pless, R. H.

NAG 5-1152 Swarthmore College 5375
The three dimensional structure of the infrared cirrus
Period Obligations
06/15/89-06/14/90 FY89: \$22,248 TOTAL: \$22,248
Prin. Invest. NASA Tech. Officer CASE Category
Gaustad, J. E. GSFC/West, D. K. 11-Astronomy

NAG 3-1002 Temple University 5376
Turbulence modeling the tensorial length scale approach
Period Obligations
01/30/89-01/29/90 FY89: \$44,890 TOTAL: \$44,890
Prin. Invest. NASA Tech. Officer CASE Category
Lin, A. LERC/Simon, F. F. 46-Mech Engr

NAG 9-133 Thomas Jefferson University 5377
Maintenance of muscle strength in human crew members during space flight
Period Obligations
04/01/86-10/01/89 FY89: TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
Herbison, G. J. JSC/Harris, B. 56-Medical Sciences
Jaweed, M. M. JSC/Carney, J. H.

NAG 2-426 University of Pennsylvania 5378
Human factors simulation research
Period Obligations
10/01/86-10/31/89 FY89: \$122,000 TOTAL: \$363,700
Prin. Invest. NASA Tech. Officer CASE Category
Badler, N. ARC/Larimer, J. O. 69-Psych, NEC

**NASA'S UNIVERSITY PROGRAM
PENNSYLVANIA (Continued)**

NAG 2-556 University of Pennsylvania 5379
Plant response to phototropic stimulations in altered gravitational fields
Period Obligations
10/01/88-10/31/89 FY89: \$20,389 TOTAL: \$20,389
Prin. Invest. NASA Tech. Officer CASE Category
Heathcote, D. G. ARC/Winget, C. M. 11-Astronomy
Brown, A. H. ARC/Callahan, P. X.

NAG 5-1015 University of Pennsylvania 5380
Selected M type supergiants and bright giants
Period Obligations
10/15/87-10/14/88 FY89: TOTAL: \$3,006
Prin. Invest. NASA Tech. Officer CASE Category
Koch, R. H. GSFC/Kondo, Y. 11-Astronomy
Holenstein, B. D.
Pfeiffer, R. J.

NAG 5-1045 University of Pennsylvania 5381
Robot learning by exploration and dissimily
Period Obligations
05/01/88-10/31/89 FY89: TOTAL: \$90,000
Prin. Invest. NASA Tech. Officer CASE Category
Bajcsy, R. GSFC/Premack, T. 49-Engr, NEC

NAG 5-1168 University of Pennsylvania 5382
Hot, massive binaries
Period Obligations
07/15/89-07/14/90 FY89: \$14,000 TOTAL: \$14,000
Prin. Invest. NASA Tech. Officer CASE Category
Koch, R. H. GSFC/West, D. K. 11-Astronomy

NAG 8-611 University of Pennsylvania 5383
Growth of dna crystals in a microgravity environment
Period Obligations
06/01/87-05/31/89 FY89: TOTAL: \$109,348
Prin. Invest. NASA Tech. Officer CASE Category
Voet, D. H. MSFC/Carter, D. C. 11-Astronomy

NAG 8-770 University of Pennsylvania 5384
Growth of DNA crystals in a microgravity environment
Period Obligations
06/01/89-05/31/90 FY89: \$110,000 TOTAL: \$110,000
Prin. Invest. NASA Tech. Officer CASE Category
Voet, D. MSFC/Snyder, R. S. 12-Chemistry

NAG 9-154 University of Pennsylvania 5385
Pathophysiology of venous gas embolism
Period Obligations
07/01/86-01/01/90 FY89: TOTAL: \$360,886
Prin. Invest. NASA Tech. Officer CASE Category
Lambertson, C. J. JSC/Waligora, J. M. 56-Medical Sciences
Eckenhoff, R.

NAG 9-342 University of Pennsylvania 5386
Biochemical endocrine and gematological study
Period Obligations
04/01/89-04/01/90 FY89: \$127,000 TOTAL: \$127,000
Prin. Invest. NASA Tech. Officer CASE Category
Lambertson, C. J. JSC/Waligora, J. M. 56-Medical Sciences
JSC/Horrigan, D. J.

NAGW 1782 University of Pennsylvania 5387
Reexamination of data from the astroid/meteoroid detector
Period Obligations
03/15/89-03/14/90 FY89: \$45,000 TOTAL: \$45,000
Prin. Invest. NASA Tech. Officer CASE Category
Soberman, R. K. HQ-EL/Bergstraih, J. T. 11-Astronomy

NAG10-21 University of Pennsylvania 5388
Plant morphogenesis and physiological behavior in relation to gravity
Period Obligations
07/09/85-03/31/89 FY89: \$20,984 TOTAL: \$129,843
Prin. Invest. NASA Tech. Officer CASE Category
Brown, A. KSC/Knott, W. M. 39-Env Sci, NEC

NAG10-25 University of Pennsylvania 5389
Corrosion prevention of iron and steel by means of polyani line coatings
Period Obligations
10/01/85-01/15/88 FY89: TOTAL: \$128,714
Prin. Invest. NASA Tech. Officer CASE Category
MacDiarmid, A. G. KSC/Bryan, C. J. 99-Multi-Discip

NAS 9-17003 University of Pennsylvania 5390
Laser anthropometric measurement system algorithm development
Period Obligations
09/01/83-10/01/88 FY89: TOTAL: \$322,244
Prin. Invest. NASA Tech. Officer CASE Category
Altschuler, M. D. JSC/Woolford, B. J. 29-Math/Computer, NEC

NAS 9-17238 University of Pennsylvania 5391
Biochemical and hematological evaluation of definition of oxygen tolerance in man
Period Obligations
01/01/85-01/01/89 FY89: TOTAL: \$317,820
Prin. Invest. NASA Tech. Officer CASE Category
Lambertsen, C. J. JSC/Waligora, J. M. 59-Life Sci, NEC

NGT 00-050-063 University of Pennsylvania 5392
NASA graduate student researchers program
Period Obligations
09/01/86-08/31/88 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Balder, N. HQ-XE/Owens, F. C. 22-Computer Science

NGT 00-050-066 University of Pennsylvania 5393
NASA graduate student researchers program
Period Obligations
06/01/86-05/31/89 FY89: TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Finin, T. HQ-LE/Owens, F. C. 22-Computer Science
Balder, N.

NGT 00-050-139 University of Pennsylvania 5394
NASA graduate student researchers program
Period Obligations
06/01/87-05/31/89 FY89: TOTAL: \$22,500
Prin. Invest. NASA Tech. Officer CASE Category
Forsman, W. HQ-XE/Owens, F. C. 43-Chem Engr

NGT 39-090-800 University of Pennsylvania 5395
NASA graduate student researchers program
Period Obligations
03/01/85-08/31/88 FY89: TOTAL: \$55,000
Prin. Invest. NASA Tech. Officer CASE Category
Shen, B. HQ-LE/Owens, F. C. 19-Phys Sci, NEC

**NASA'S UNIVERSITY PROGRAM
PENNSYLVANIA (Continued)**

NAG 2-53 University of Pittsburgh 5396
A survey of nearby stars for the perturbative effects of extrasolar planetary systems
Period Obligations
09/01/80-05/31/88 FY89: TOTAL: \$591,229
Prin. Invest. NASA Tech. Officer CASE Category
Gatewood, G. D. ARC/Scargle, J. 11-Astronomy
Stein, J. W. HQ-EL/Black, D. C.

NAG 3-603 University of Pittsburgh 5397
Low temperature luminescence RBS/channeling of B SIC-CVD films
Period Obligations
01/13/85-01/10/90 FY89: \$30,000 TOTAL: \$125,985
Prin. Invest. NASA Tech. Officer CASE Category
Choyke, W. J. HQ-EE/Lagerloef, G. 13-Physics
LERC/Matus, L. G

NAG 3-729 University of Pittsburgh 5398
Computer simulation of a pilot in V/STOL aircraft control loops
Period Obligations
09/01/86-11/29/88 FY89: TOTAL: \$99,173
Prin. Invest. NASA Tech. Officer CASE Category
Vogt, W. B. LERC/Mihalow, J. R. 49-Engr, NEC
Mickle, M. H.

NAG 3-829 University of Pittsburgh 5399
Parallel computations for finite element analysis
Period Obligations
11/05/87-01/01/90 FY89: TOTAL: \$28,135
Prin. Invest. NASA Tech. Officer CASE Category
Smolinski, P. LERC/Kiraly, L. J. 41-Aero Engr

NAG 3-945 University of Pittsburgh 5400
High frequency high temp soft magnetic characterization
Period Obligations
10/01/88-01/30/90 FY89: \$51,998 TOTAL: \$51,998
Prin. Invest. NASA Tech. Officer CASE Category
Wieserman, W. R. LERC/Schwarze, G. E. 45-Elec Engr

NAG 3-973 University of Pittsburgh 5401
Lubrication effectiveness of fluids with microstructure
Period Obligations
01/01/89-12/31/89 FY89: \$55,803 TOTAL: \$55,803
Prin. Invest. NASA Tech. Officer CASE Category
Khonsari, M. M. LERC/Brewe, D. E. 49-Engr, NEC
Rajagopal, K. R. LERC/Pepper, S. V.

NAG 5-609 University of Pittsburgh 5402
Sounding rocket study of N₂O, NO, and other trace constituents in the upper stratosphere and mesosphere
Period Obligations
07/01/82-12/31/89 FY89: \$156,790 TOTAL: \$816,542
Prin. Invest. NASA Tech. Officer CASE Category
Zipf, E. C. GSFC/Early, L. J. 13-Physics
Erdman, P. W. GSFC/Pless, R. H.

NAG 6-2 University of Pittsburgh 5403
Studies of the physics and chemistry of the terrestrial atmosphere
Period Obligations
10/01/79-11/30/89 FY89: \$39,500 TOTAL: \$1,138,279
Prin. Invest. NASA Tech. Officer CASE Category
Zipf, E. C. GSFC/Early, L. J. 19-Phys Sci, NEC
GSFC/Pless, R. H.

NAGW 1270 University of Pittsburgh 5404
Search for planetary systems
Period Obligations
12/01/87-11/30/89 FY89: \$101,998 TOTAL: \$203,998
Prin. Invest. NASA Tech. Officer CASE Category
Wefel, J. P. HQ-EL/Rahe, J. H. 11-Astronomy

NAGW 1569 University of Pittsburgh 5405
Secondary ionization phenomena and plasma wave generation in the upper atmosphere due to EUV radiation entrapment
Period Obligations
02/01/89-01/31/90 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
Zipf, E. C. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Perry, T. W.

NAGW 1764 University of Pittsburgh 5406
Electron ion recombination and ion molecule reaction processes relating to planetary atmospheres
Period Obligations
05/15/89-05/14/90 FY89: \$89,883 TOTAL: \$89,883
Prin. Invest. NASA Tech. Officer CASE Category
Johnsen, R. HQ-EL/Bergstrahl, J. T. 11-Astronomy

NASW 4204 University of Pittsburgh 5407
Operation of a NASA Industrial Applications Center
Period Obligations
08/01/86-06/30/90 FY89: \$617,200 TOTAL: \$1,570,982
Prin. Invest. NASA Tech. Officer CASE Category
McWilliams, P. A. HQ/Bivins, R. 44-Civil Engr
HQ/Clarks, H.

NGL 39-011-030 University of Pittsburgh 5408
Studies of excitation and collision deactivation of measurable A₃ state of nitrogen in the aurora and day airglow
Period Obligations
05/07/65-11/30/89 FY89: \$24,995 TOTAL: \$1,652,139
Prin. Invest. NASA Tech. Officer CASE Category
Zipf, E. C. HQ-EL/Bergstrahl, J. T. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NSG 7147 University of Pittsburgh 5409
Photometric analyses of Mariner 10 images of Venus and Mercury
Period Obligations
06/23/75-10/31/89 FY89: \$59,600 TOTAL: \$470,997
Prin. Invest. NASA Tech. Officer CASE Category
Hapke, B. HQ-EL/Underwood, J. R. 11-Astronomy
HQ-EL/Boyce, J. M.

NAG 5-343 Villanova University 5410
Ultraviolet observations relative to astronomical sources
Period Obligations
07/15/83-09/14/90 FY89: \$28,600 TOTAL: \$154,906
Prin. Invest. NASA Tech. Officer CASE Category
Sion, E. M. GSFC/West, D. 11-Astronomy
Bruhweiler, F. C.
Vauclair, G.

NAG 5-382 Villanova University 5411
Coordinated ultraviolet spectroscopy and optical photometry of selected cool giants
Period Obligations
01/01/84-09/30/90 FY89: \$65,900 TOTAL: \$161,534
Prin. Invest. NASA Tech. Officer CASE Category
Guinan, E. F. GSFC/West, D. 11-Astronomy
Maloney, F. P.
Wacker, S. W.

NASA'S UNIVERSITY PROGRAM **PENNSYLVANIA (Continued)**

NAG 5-980 Villanova University 5412
 Simultaneous IUE and magnetic field observations of a selected young dwarf
Period Obligations
 09/01/87-08/31/90 FY89: \$39,700 TOTAL: \$61,158
Prin. Invest. NASA Tech. Officer CASE Category
 Ambruster, C. GSFC/West, D. 11-Astronomy

NAG 3-1016 Brown University 5419
 Turbulent shear flows
Period Obligations
 02/23/89-02/22/90 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
 Liu, J. T. LERC/Rice, E. J. 41-Aero Engr
 LERC/Zaman, K. B.

NAG 5-982 Villanova University 5413
 Long term variations of chromospheric transition region and starspot activity ultraviolet observations of the unique contact binary VZ piscium
Period Obligations
 09/01/87-08/31/89 FY89: TOTAL: \$27,542
Prin. Invest. NASA Tech. Officer CASE Category
 Guinan, E. F. GSFC/Kondo, Y. 11-Astronomy
 Hrivnak, B. J.
 Vilhu, O.

NAG 5-526 Brown University 5420
 Theoretical studies of resource enhance stimulated Raman scattering frequency double laser wavelengths
Period Obligations
 07/01/85-07/31/90 FY89: \$65,000 TOTAL: \$282,088
Prin. Invest. NASA Tech. Officer CASE Category
 Lawandy, N. M. GSFC/Degnan, J. J. 13-Physics
 GSFC/Monosmith, W. B.

NAG 5-1284 Villanova University 5414
 An archival search for ancient nova shells
Period Obligations
 10/01/89-09/30/90 FY89: \$7,900 TOTAL: \$7,900
Prin. Invest. NASA Tech. Officer CASE Category
 Sion, E. M. GSFC/West, D. 11-Astronomy

NAG 5-1130 Brown University 5421
 Asthenosphere dynamics the effects of viscosity and compositional stratification in connection beneath the oceanic lithosphere
Period Obligations
 04/15/89-04/14/90 FY89: \$30,913 TOTAL: \$30,913
Prin. Invest. NASA Tech. Officer CASE Category
 Pamentier, E. M. GSFC/Welker, J. E. 32-Geological Sci

RHODE ISLAND

NAG 1-517 Brown University 5415
 Feedback control of distributed continuum models
Period Obligations
 09/01/84-12/31/89 FY89: \$90,181 TOTAL: \$426,122
Prin. Invest. NASA Tech. Officer CASE Category
 Banks, H. T. LARC/Armstrong, E. S. 21-Mathematics
 HQ-ES/Perry, T. W.

NAG 9-109 Brown University 5422
 Experimental metamorphic studies of iron sulfide silicate reactions in enstatite chondrites
Period Obligations
 05/01/85-04/30/90 FY89: \$50,000 TOTAL: \$233,000
Prin. Invest. NASA Tech. Officer CASE Category
 Hess, P. C. JSC/Browne, I. D. 47-Materials Engr

NAG 9-184 Brown University 5423
 Remote sensing information applied to geological studies of planets
Period Obligations
 10/01/86-10/01/90 FY89: \$27,500 TOTAL: \$98,500
Prin. Invest. NASA Tech. Officer CASE Category
 Pieters, C. M. JSC/Browne, I. D. 32-Geological Sci

NAG 1-634 Brown University 5416
 Concurrent algorithms for transient nonlinear finite element analysis
Period Obligations
 02/15/86-12/31/89 FY89: TOTAL: \$261,090
Prin. Invest. NASA Tech. Officer CASE Category
 Ortiz, M. LARC/Housner, J. M. 46-Mech Engr
 LARC/Jeffrey, G. L.

NAG 9-239 Brown University 5424
 Role of C o H s volatiles in Mars volcanism experiments on a tholeiite and the FE rich shergotty magma compositions
Period Obligations
 06/01/87-06/01/88 FY89: TOTAL: \$55,000
Prin. Invest. NASA Tech. Officer CASE Category
 Rutherford, M. J. JSC/Browne, I. D. 32-Geological Sci

NAG 1-703 Brown University 5417
 Computational fluid dynamics and turbulence
Period Obligations
 10/15/86-02/28/90 FY89: \$50,000 TOTAL: \$146,280
Prin. Invest. NASA Tech. Officer CASE Category
 Gottlieb, D. LARC/Erlebacher, G. 41-Aero Engr
 Sirovich, L.

NAGW 28 Brown University 5425
 Remote sensing information applied to geological studies of planets
Period Obligations
 02/14/80-09/30/89 FY89: \$80,000 TOTAL: \$966,222
Prin. Invest. NASA Tech. Officer CASE Category
 Pieters, C. M. HQ-EL/Underwood, J. 32-Geological Sci
 HQ-EL/Boyce, J. M.

NAG 3-673 Brown University 5418
 Turbulent shear flows and their control
Period Obligations
 12/15/85-12/29/88 FY89: TOTAL: \$130,000
Prin. Invest. NASA Tech. Officer CASE Category
 Liu, J. T. LERC/Rice, E. J. 41-Aero Engr
 LERC/Zaman, K. B.

NAGW 137 Brown University 5426
 Geologic processes on the Galilean satellites: Impace cratering, volcanism and tectonism
Period Obligations
 03/01/81-10/31/89 FY89: \$46,184 TOTAL: \$639,354
Prin. Invest. NASA Tech. Officer CASE Category
 Head, J. W. HQ-EL/Underwood, J. R. 32-Geological Sci
 HQ-EL/Boyce, J. M.

NASA'S UNIVERSITY PROGRAM
RHODE ISLAND (Continued)

NAGW 657 Brown University 5427
 Quant temperature measurement in laser-heated, diamond-cell experiment
Period Obligations
 09/01/84-10/31/88 FY89: TOTAL: \$389,694
Prin. Invest. NASA Tech. Officer CASE Category
 Goettel, K. A. HQ-E/Rosendhal, J. D. 32-Geological Sci
 HQ-EP/Konkel, R. M.

NAGW 705 Brown University 5428
 Planetary impact processes
Period Obligations
 03/01/85-09/30/89 FY89: \$167,538 TOTAL: \$726,279
Prin. Invest. NASA Tech. Officer CASE Category
 Schultz, P. H. HQ-EL/Underwood, J. R. 32-Geological Sci
 HQ-EL/Boyce, J. M.

NAGW 713 Brown University 5429
 Venus data analysis of radar images and global data sets
Period Obligations
 03/01/85-09/30/89 FY89: \$58,684 TOTAL: \$252,255
Prin. Invest. NASA Tech. Officer CASE Category
 Head, J. W. HQ-EL/Underwood, J. R. 32-Geological Sci
 HQ-EL/Boyce, J. M.

NAGW 748 Brown University 5430
 Reflectance experiment laboratory
Period Obligations
 05/01/85-09/30/89 FY89: \$57,750 TOTAL: \$268,347
Prin. Invest. NASA Tech. Officer CASE Category
 Pieters, C. M. HQ-EL/Underwood, J. R. 32-Geological Sci
 HQ-EL/Boyce, J. M.

NAGW 855 Brown University 5431
 Brown University regional planetary data facility
Period Obligations
 11/01/85-09/30/89 FY89: \$32,100 TOTAL: \$118,952
Prin. Invest. NASA Tech. Officer CASE Category
 Schultz, P. H. HQ-EL/Underwood, J. R. 32-Geological Sci
 HQ-EL/French, B. M.

NAGW 1075 Brown University 5432
 Mars tectonics and volcanism
Period Obligations
 07/01/87-06/30/90 FY89: \$25,000 TOTAL: \$64,989
Prin. Invest. NASA Tech. Officer CASE Category
 Head, J. W. HQ-EL/Underwood, J. R. 32-Geological Sci
 HQ-EL/Boyce, J. M.

NAGW 1076 Brown University 5433
 Volcanic and tectonic history of the Martian highlands
Period Obligations
 06/01/87-05/31/90 FY89: \$4,000 TOTAL: \$12,000
Prin. Invest. NASA Tech. Officer CASE Category
 Schultz, P. H. HQ-EL/Underwood, J. R. 32-Geological Sci
 HQ-EL/Boyce, J. M.

NAGW 1118 Brown University 5434
 Volcanism and continental evolution using mapping spectrometer data
Period Obligations
 04/15/87-01/14/90 FY89: \$80,000 TOTAL: \$253,469
Prin. Invest. NASA Tech. Officer CASE Category
 Pieters, C. M. HQ-EE/Baltuck, M. 32-Geological Sci
 HQ-EE/Pieper, T. J.

NAGW 1393 Brown University 5435
 Role of C-O-H-S volatiles in Mars volcanism experiments on basalts evolved magmas and the FE rich Shergotty composition
Period Obligations
 06/01/88-05/30/90 FY89: \$55,000 TOTAL: \$120,000
Prin. Invest. NASA Tech. Officer CASE Category
 Rutherford, M. J. HQ-EL/Underwood, J. R. 19-Phys Sci, NEC

NGR 40-002-088 Brown University 5436
 Analysis of Martian geologic features of Earth analogs
Period Obligations
 10/20/69-09/30/89 FY89: \$95,420 TOTAL: \$1,955,614
Prin. Invest. NASA Tech. Officer CASE Category
 Head, J. W. HQ-EL/Underwood, J. 32-Geological Sci
 HQ-EL/Boyce, J. M.

NGR 40-002-116 Brown University 5437
 Lunar basins processes and structure
Period Obligations
 02/20/73-09/30/89 FY89: \$77,600 TOTAL: \$1,410,889
Prin. Invest. NASA Tech. Officer CASE Category
 Head, J. W. HQ-EL/Underwood, J. 32-Geological Sci
 HQ-EL/French, B. M.

NGT 00-050-146 Brown University 5438
 NASA graduate student researchers program
Period Obligations
 05/01/87-04/30/89 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
 Lawady, N. HQ-XE/Owens, F. C. 13-Physics

NGT 00-050-147 Brown University 5439
 NASA graduate student researchers program
Period Obligations
 06/01/87-05/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
 Head, J. W. HQ-XE/Owens, F. C. 32-Geological Sci

NGT 00-050-229 Brown University 5440
 NASA graduate student researchers program
Period Obligations
 07/01/87-06/30/89 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
 Rutherford, M. J. HQ-XE/Owens, F. C. 32-Geological Sci

NGT 00-050-325 Brown University 5441
 NASA graduate student researchers program
Period Obligations
 09/01/88-08/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
 Schultz, P. H. HQ-XE/Owens, F. C. 32-Geological Sci

NGT 00-050-420 Brown University 5442
 NASA graduate student researchers program
Period Obligations
 07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
 Vitter, J. S. HQ-XE/Owens, F. C. 22-Computer Science

NGT 00-050-457 Brown University 5443
 NASA graduate student researchers program
Period Obligations
 07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
 Pieters, C. M. HQ-XE/Owens, F. C. 32-Geological Sci

NASA'S UNIVERSITY PROGRAM
RHODE ISLAND (Continued)

NGT 40-002-802 **Brown University** **5444**
 NASA graduate student researchers program
Period *Obligations*
 09/01/85-08/31/87 FY89: TOTAL: \$33,800
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Lawandy, N. HQ-LE/Owens, F. C. 13-Physics

NSG 7570 **Brown University** **5445**
 Surface processes on Mars and its satellites with emphasis on cratering, volcanism and the evolution of Valles Marineris
Period *Obligations*
 04/01/79-09/30/89 FY89: \$89,476 TOTAL: \$851,304
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Head, J. W. HQ-EL/Underwood, J. R. 32-Geological Sci
 HQ-EL/Boyce, J. M.

NSG 7589 **Brown University** **5446**
 Experimental investigation of basalt-C-O-H-S gas equilibria and fumarolic alteration on Mars
Period *Obligations*
 03/01/79-11/30/87 FY89: TOTAL: \$346,856
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Rutherford, M. J. HQ-EL/Boyce, J. M. 32-Geological Sci
 HQ-EL/French, B. M.

NSG 7605 **Brown University** **5447**
 Endogenic processes affect in the surfaces of Ganymede and Callisto
Period *Obligations*
 05/01/79-11/30/89 FY89: \$95,700 TOTAL: \$506,676
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Parmentier, E. M. HQ-EL/Underwood, J. R. 32-Geological Sci
 HQ-EL/Boyce, J. M.

NAG 1-519 **University of Rhode Island** **5448**
 Fiber optic pressure sensors in skin-friction measurements
Period *Obligations*
 09/01/84-10/31/89 FY89: \$4,487 TOTAL: \$181,965
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Cuomo, F. W. LARC/Zuckerwar, A. J. 13-Physics
 Letcher, S. V. LARC/Holmes, H. K.

NAG 5-1052 **University of Rhode Island** **5449**
 Denitrification nitrous oxide carbon dioxide and soil moisture dynamics at the landscape level
Period *Obligations*
 06/15/88-01/31/90 FY89: \$29,000 TOTAL: \$56,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Groffman, P. GSFC/Levine, E. 39-Env Sci, NEC
 Tiedje, J. GSFC/Hall, F.

NAGW 858 **University of Rhode Island** **5450**
 Objective edge detection in SST fields and a survey of open ocean paired vortices
Period *Obligations*
 04/01/86-03/31/89 FY89: TOTAL: \$476,709
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Cornillon, P. HQ-EE/Yoder, J. A. 33-Oceanography
 Carter, E. HQ-EE/Wilson, W. S.

SOUTH CAROLINA

NAG 5-921 **Citadel Military College of S C** **5451**
 Photographic region elemental analyses
Period *Obligations*
 06/01/87-05/31/90 FY89: TOTAL: \$60,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Adelman, S. J. GSFC/Leckrone, D. S. 11-Astronomy

NAG 1-680 **Clemson University - Clemson** **5452**
 Thermoplastic coating of carbon fibers
Period *Obligations*
 05/15/86-11/06/89 FY89: \$24,751 TOTAL: \$157,385
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Edie, D. D. LARC/Baucom, R. M. 43-Chem Engr
 Drews, M. J. LARC/Nelson, J. B.
 Ellison, M. S.

NAG 1-724 **Clemson University - Clemson** **5453**
 Fracture criteria for discontinuous metal matrix composites
Period *Obligations*
 11/17/86-06/16/89 FY89: TOTAL: \$140,616
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Rack, H. J. LARC/Brewer, W. D. 47-Materials Engr
 Goree, J. G. LARC/Johnson, W. S.

NAG 1-755 **Clemson University - Clemson** **5454**
 Sufficiency and necessity in reliability modeling
Period *Obligations*
 04/15/87-02/14/90 FY89: \$40,000 TOTAL: \$110,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Geist, R. S. LARC/Bavuso, S. J. 29-Math/Cmputer, NEC
 Smotherman, M. K. LARC/Pitts, F. L.

NAG 1-820 **Clemson University - Clemson** **5455**
 Superconducting wire fabrication
Period *Obligations*
 09/16/87-06/30/90 FY89: \$89,999 TOTAL: \$140,790
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Haertling, G. H. LARC/Buckley, J. D. 47-Materials Engr
 Fain, C. C. LARC/Winfree, W. P.

NAG 1-914 **Clemson University - Clemson** **5456**
 Knitted carbon fiber preforms
Period *Obligations*
 11/16/88-02/15/90 FY89: \$17,000 TOTAL: \$17,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Drews, M. J. LARC/Taylor, A. H. 49-Engr, NEC

NAG 1-928 **Clemson University - Clemson** **5457**
 Windshear detection radar signal processing
Period *Obligations*
 11/16/88-11/15/89 FY89: \$52,073 TOTAL: \$52,073
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Baxa, E. G. LARC/MacKenzie, A. I. 45-Elec Engr
 LARC/Staton, L. D.

NAG 1-971 **Clemson University - Clemson** **5458**
 Micro mechanical analysis of damage growth and fracture in discontinuous fiber reinforced metal matrix composites
Period *Obligations*
 02/01/89-01/31/90 FY89: \$48,727 TOTAL: \$48,727
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Goree, J. G. LARC/Johnson, W. S. 46-Mech Engr
 LARC/Harris, C. E.

**NASA'S UNIVERSITY PROGRAM
SOUTH CAROLINA (Continued)**

NAG 1-1024 Clemson University - Clemson 5459			
Software reliability for real time control systems			
<i>Period</i>	<i>Obligations</i>		
08/16/89-08/15/90	FY89: \$20,000	TOTAL: \$20,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Geist, R. M.	LARC/Liceaga, C. A.	29-Math/Computer, NEC	
Offutt, A. J.	LARC/Finelli, G. B.		
NAG 3-1072 Clemson University - Clemson 5460			
S-1 and S-2 methods and three dimensional flow solutions and turbomachinery			
<i>Period</i>	<i>Obligations</i>		
01/10/90-01/09/91	FY89: \$30,000	TOTAL: \$30,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Wu, C. H.	LERC/Reid, L.	46-Mech Engr	
	LERC/Reames, R.		
NAG 5-632 Clemson University - Clemson 5461			
Experimental and theoretical investigations of high-latitude thermospheric dynamics			
<i>Period</i>	<i>Obligations</i>		
12/12/85-12/11/89	FY89: \$40,000	TOTAL: \$224,203	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Larsen, M. F.	GSFC/Early, L. J.	13-Physics	
	GSFC/Pless, R. H.		
NAG 5-651 Clemson University - Clemson 5462			
An investigation of millimeter-wavelength radar techniques for remote sensing of geophysical atmospheric and oceanographic parameters			
<i>Period</i>	<i>Obligations</i>		
09/01/88-06/30/90	FY89: \$31,781	TOTAL: \$52,253	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Ulbrich, C. W.	GSFC/Parsons, C. L.	45-Elec Engr	
Miller, L. S.	GSFC/Hayne, G. S.		
NAG10-56 Clemson University - Clemson 5463			
Fluid dynamics of phase separation in a field of centrifugal acceleration			
<i>Period</i>	<i>Obligations</i>		
05/01/89-04/30/90	FY89: \$49,694	TOTAL: \$49,694	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Kumar, R.	KSC/Howard, F. S.	46-Mech Engr	
NAS 5-30688 Clemson University - Clemson 5464			
A low cost portable telemetry and control system			
<i>Period</i>	<i>Obligations</i>		
06/12/89-06/11/90	FY89: \$69,843	TOTAL: \$69,843	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Collins, A. S.	GSFC/Dominy, C. T.	45-Elec Engr	
NAS 8-37851 Clemson University - Clemson 5465			
Nonlinear wave plasma interaction study			
<i>Period</i>	<i>Obligations</i>		
09/16/88-09/16/92	FY89: \$65,000	TOTAL: \$95,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Duncan, L. M.	MSFC/Stone, J. F.	13-Physics	
NCC 1-93 Clemson University - Clemson 5466			
An in plane shear material property test for composite laminates			
<i>Period</i>	<i>Obligations</i>		
03/04/85-08/07/89	FY89:	TOTAL: \$142,620	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Kennedy, J. M.	LARC/Farley, G. L.	47-Materials Engr	
	LARC/Baker, D. J.		
NCC 1-127 Clemson University - Clemson 5467			
Mechanical evaluation of through-the-thickness reinforced composite materials			
<i>Period</i>	<i>Obligations</i>		
08/15/88-08/31/90	FY89:	TOTAL: \$34,290	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Kennedy, J. M.	LARC/Farley, G. L.	47-Materials Engr	
	LARC/Dexter, H. B.		
NCC 1-128 Clemson University - Clemson 5468			
An investigation to determine the producibility of a three-dimension braider and bias direction weaving loom			
<i>Period</i>	<i>Obligations</i>		
08/15/88-02/31/90	FY89: \$58,436	TOTAL: \$85,941	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Huey, C.	LARC/Farley, G. L.	47-Materials Engr	
NCC 1-134 Clemson University - Clemson 5469			
Non circular cross section fibers for carbon composites			
<i>Period</i>	<i>Obligations</i>		
02/03/89-02/02/90	FY89: \$34,190	TOTAL: \$34,190	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Edie, D. D.	LARC/Maahs, H. G.	47-Materials Engr	
Fain, C. C.	LARC/Ransone, P. O.		
NGT 00-050-005 Clemson University - Clemson 5470			
NASA graduate student researchers program			
<i>Period</i>	<i>Obligations</i>		
08/18/86-08/17/89	FY89:	TOTAL: \$54,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Geist, R.	HQ-LE/Owens, F. C.	22-Computer Science	
Smotherma, M.			
NGT 00-050-090 Clemson University - Clemson 5471			
NASA graduate student researchers program			
<i>Period</i>	<i>Obligations</i>		
06/06/86-09/05/89	FY89:	TOTAL: \$52,710	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Schalkoff, R. J.	HQ-LE/Owens, F. C.	22-Computer Science	
NGT 00-050-414 Clemson University - Clemson 5472			
NASA graduate student researchers program			
<i>Period</i>	<i>Obligations</i>		
05/01/89-04/30/90	FY89: \$18,000	TOTAL: \$18,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Baxa, E. G.	HQ-XE/Owens, F. C.	45-Elec Engr	
NGT 00-050-419 Clemson University - Clemson 5473			
NASA graduate student researchers program			
<i>Period</i>	<i>Obligations</i>		
07/01/89-06/30/90	FY89: \$18,000	TOTAL: \$18,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Collins, A.	HQ-XE/Owens, F. C.	22-Computer Science	
NGT 00-070-028 Clemson University - Clemson 5474			
Graduate student researchers underrepresented minority focus program			
<i>Period</i>	<i>Obligations</i>		
08/18/87-08/17/90	FY89: \$18,000	TOTAL: \$54,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Grist, R. M.	HQ-XE/Owens, F. C.	22-Computer Science	
Smotherman, M. K.			

NASA'S UNIVERSITY PROGRAM **SOUTH CAROLINA (Continued)**

NGT 00-070-055 Clemson University - Clemson 5475
NASA graduate student researchers program
Period *Obligations*
08/15/87-12/31/89 FY89: \$12,900 TOTAL: \$30,900
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Baxa, E. G. HQ-XE/Owens, F. C. 45-Elec Engr

NGT 41-001-800 Clemson University - Clemson 5476
NASA graduate student researchers program
Period *Obligations*
04/01/83-09/30/89 FY89: TOTAL: \$12,696
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Isgell, J. T. HQ-LB/Owens, F. C. 13-Physics

NAG 8-646 Furman University 5477
Integrating expert and database management systems for SSME data analysis
Period *Obligations*
06/15/87-05/31/89 FY89: TOTAL: \$26,683
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Abernethy, K. MSFC/Hill, E. 29-Math/Cmputer,NEC

NAG 9-169 University of South Carolina 5478
Basaltic volcanism and ancient planetary crusts
Period *Obligations*
06/01/86-06/01/90 FY89: \$22,048 TOTAL: \$84,508
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Shervais, J. W. JSC/Browne, I. D. 32-Geological Sci

NAG 9-187 University of South Carolina 5479
Solid phase change storage material property research
Period *Obligations*
10/08/86-07/01/89 FY89: TOTAL: \$38,799
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Morehouse, J. H. JSC/Darcy, E. C. 46-Mech Engr
JSC/Kelly, G. E.

NAG 9-311 University of South Carolina 5480
Thermal analysis of power subsystem components
Period *Obligations*
06/01/88-01/01/90 FY89: TOTAL: \$15,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Morehouse, J. H. JSC/Wagner, H. A. 46-Mech Engr

NAS13-358 University of South Carolina 5481
Commercial environmental sensitivity index ESI mapping using remote sensing and GSI technology
Period *Obligations*
08/29/88-09/30/90 FY89: \$35,975 TOTAL: \$191,883
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Jensen, J. R. SSC/Hill, C. L. 39-Env Sci, NEC

SOUTH DAKOTA

NAG 1-542 South Dakota School of Mines & Tech 5482
Modeling and parameterization of horizontally inhomoleneous cloud radiative properties
Period *Obligations*
12/06/84-03/05/90 FY89: \$74,700 TOTAL: \$242,188
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Sengupta, S. K. LARC/Wielicki, B. A. 31-Atmos Sci

NAG 5-386 South Dakota School of Mines & Tech 5483
Rain volume estimation over areas using satellite and radar data
Period *Obligations*
01/01/84-12/31/89 FY89: \$34,934 TOTAL: \$408,327
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Smith, P. GSFC/Wu, M. L. 31-Atmos Sci
Vonder Haar, T. H.

NAG 8-632 South Dakota School of Mines & Tech 5484
A cloud precipitation and electrification modeling effort for COHMEX
Period *Obligations*
05/20/87-05/19/90 FY89: \$85,000 TOTAL: \$260,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Orville, H. MSFC/Robertson, F. R. 31-Atmos Sci
MSFC/Blakeslee, R. J.

NAG 8-633 South Dakota School of Mines & Tech 5485
Microphysical and electrical structure of small connective systems in the southeastern part of U.S.A.
Period *Obligations*
05/20/87-05/20/90 FY89: \$48,832 TOTAL: \$169,791
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Smith, P. MSFC/Robertson, F. R. 31-Atmos Sci
MSFC/Blakeslee, R. J.

NAG 9-22 South Dakota School of Mines & Tech 5486
Petrologic and stratigraphic studies of planetary regoliths
Period *Obligations*
02/01/82-02/01/90 FY89: \$110,000 TOTAL: \$952,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Papike, J. J. JSC/Browne, I. D. 32-Geological Sci

NAS 5-28766 South Dakota State University 5487
Modeling energy flow and nutrients cycle in natural grassland ecosystems w/aid of thematic mapper data
Period *Obligations*
08/07/85-12/05/89 FY89: TOTAL: \$499,447
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lewis, J. K. GSFC/Oseroff, H. 39-Env Sci, NEC
Miller, L. D. GSFC/Stuart, L.
Parton, W. J., Jr.

NAG 2-492 University of South Dakota 5488
The human computer interface in the modern mission control center
Period *Obligations*
03/01/88-10/14/89 FY69: \$46,582 TOTAL: \$61,582
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Granaas, M. M. ARC/Rhea, D. C. 41-Aero Engr
ARC/Wheaton, D. L.

TENNESSEE

NAG 8-25 Fisk University 5489
Thermal characterization of crystals
Period *Obligations*
07/05/84-06/29/89 FY89: \$1,211 TOTAL: \$608,433
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Silberman, E. MSFC/Randall, J. L. 13-Physics
MSFC/Walker, R. J.

NASA'S UNIVERSITY PROGRAM **TENNESSEE (Continued)**

NAG 8-113 Fisk University 5490
Growth and characterization of ternary zn CD se and zn CD te single crystals
Period *Obligations*
08/17/88-08/16/89 FY89: TOTAL: \$150,663
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Silberman, E. MSFC/Randall, J. L. 13-Physics
MSFC/Walker, R. J.

NAS 8-36166 Fisk University 5491
U.S. and foreign alloy cross reference data bases
Period *Obligations*
02/15/85-09/30/89 FY89: TOTAL: \$607,618
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Springer, J. M. MSFC/Key, C. F. 22-Computer Science
Morgan, S. H. MSFC/Sams, M. J.

NCC 2-606 Fisk University 5492
Mutant strains of cyanobacterium anabaena variabilis which excrete ammonia as source of nitrogen for plant growth in CELSS
Period *Obligations*
05/01/89-04/30/90 FY89: \$127,909 TOTAL: \$127,909
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Gunasekaran, M. ARC/MacElroy, R. D. 51-Biological Sci

NGT 43-005-901 Fisk University 5493
NASA training grant
Period *Obligations*
10/01/85-09/30/87 FY89: TOTAL: \$41,114
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Neely, G., Jr. HQ-U/Warren, L. S. 49-Engr, NEC
HQ-U/Coleman, A. M.

NAG 3-961 Memphis State University 5494
Effects of tooth prophile modifications on the dynamics of parallel shift gear transmissions
Period *Obligations*
12/15/88-12/14/89 FY89: \$58,088 TOTAL: \$58,088
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lin, H. H. LERC/Oswald, F. B. 46-Mech Engr
LERC/Zakrajsek, J. J.

NAS13-370 Middle Tennessee State University 5495
An environmental and archaeological assessment of the Piedras Negras region of Guatemala
Period *Obligations*
09/28/88-09/30/89 FY89: TOTAL: \$86,681
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Fullerton, R. O. SSC/Sever, T. L. 39-Env Sci, NEC

NAG 1-863 Tennessee State University 5496
Robust control with structured perturbations
Period *Obligations*
04/01/88-11/30/89 FY89: TOTAL: \$61,154
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Keel, L. LARC/Juang, J. N. 42-Astro Engr
LARC/Belvin, W. K.

NAG 8-22 Tennessee State University 5497
Research support for school of engineering and technology
Period *Obligations*
08/25/83-10/27/89 FY89: \$154,344 TOTAL: \$1,109,316
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Olson, L. H. MSFC/Harwell, R. 41-Aero Engr
Isibor, E. I. MSFC/Nichols, R.

NAG 8-87 Tennessee State University 5498
Wear process in the 440C ball bearings used in the HPOTP of the SSME
Period *Obligations*
04/09/87-12/31/88 FY89: TOTAL: \$177,913
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Chaudhury, D. K. MSFC/Randall, J. L. 19-Phys Sci, NEC
Verna, R. MSFC/Walker, R. J.

NAG 8-101 Tennessee State University 5499
Super plastic forging of Inconel 718
Period *Obligations*
04/13/88-05/30/89 FY89: TOTAL: \$102,993
Prin. Invest. *NASA Tech. Officer* *CASE Category*
McCain, W. S. MSFC/Randall, J. L. 47-Materials Engr
MSFC/Walker, R. J.

NAG 8-111 Tennessee State University 5500
Photometric and spectroscopic study of chromospherically active stars
Period *Obligations*
06/09/88-12/09/89 FY89: TOTAL: \$153,557
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Busby, M. R. MSFC/Randall, J. L. 11-Astronomy
MSFC/Walker, R. J.

NAG 1-844 University of Tennessee - Chattanooga 5501
New interaction theory of vorticity field and solid body with application to wing design or to mechanism of transition and turbulent boundary layer
Period *Obligations*
02/01/88-01/31/90 FY89: \$82,564 TOTAL: \$133,335
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wu, J. M. LARC/Bobbitt, P. J. 41-Aero Engr
Wu, J. Z. LARC/Putnam, L. E.

NAG 8-105 University of Tennessee - Chattanooga 5502
Expansion of nickel cadmium battery expert systems capabilities
Period *Obligations*
06/03/88-10/02/89 FY89: TOTAL: \$49,996
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bykat, A. MSFC/Weeks, D. J. 22-Computer Science

NAG 1-513 University of Tennessee - Knoxville 5503
Flight expert system files for onboard Fault monitoring and diagnosis
Period *Obligations*
08/13/84-07/31/90 FY89: TOTAL: \$445,134
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Ali, M. ARC/Abbott, K. H. 99-Multi-Discip
LARC/Schutte, P. C.

NAG 1-747 University of Tennessee - Knoxville 5504
Skin friction measurement and development of an optical sensing system
Period *Obligations*
05/15/87-02/28/90 FY89: TOTAL: \$45,570
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wu, J. M. LARC/Lawing, P. L. 41-Aero Engr
Vakili, A. D.

NAG 1-803 University of Tennessee - Knoxville 5505
Algorithms and software for solving finite element equations on serial and parallel architectures
Period *Obligations*
09/01/87-08/31/88 FY89: TOTAL: \$61,736
Prin. Invest. *NASA Tech. Officer* *CASE Category*
George, J. A. LARC/Knight, N. F. 29-Math/Cmputer, NEC
LARC/Greene, W. H.

NASA'S UNIVERSITY PROGRAM
TENNESSEE (Continued)

NAG 1-898 University of Tennessee - Knoxville 5506
 Compressible flow solutions over swept wing/body configurations with concentrated leading edge vortex sheets
Period *Obligations*
 07/18/88-10/17/89 FY89: TOTAL: \$69,990
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Steinhoff, J. S. LARC/Waggoner, E. G. 41-Aero Engr
 LARC/Luckring, J. M.

NAG 1-1008 University of Tennessee - Knoxville 5507
 Robotic control of NASA laboratory telerobotic manipulator
Period *Obligations*
 05/22/89-01/21/90 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Dubey, R. V. LARC/Hankins, W. W. 46-Mech Engr
 LARC/Barker, L. K.

NAG 2-494 University of Tennessee - Knoxville 5508
 Regulation of erythropoiesis in rats during space flight
Period *Obligations*
 01/01/88-10/31/89 FY89: \$175,065 TOTAL: \$278,065
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Lange, R. D. ARC/Mandel, A. D. 51-Biological Sci
 Jones, J. B. ARC/Leon, H. A.
 Worthington, R. E.

NAG 3-876 University of Tennessee - Knoxville 5509
 Containerless growth and physical metallurgy of large single crystals of aluminides
Period *Obligations*
 02/28/88-01/31/90 FY89: \$50,000 TOTAL: \$100,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Oliver, B. F. LERC/Nathal, M. V. 47-Materials Engr
 Brooks, C. R.
 Bruns, D.

NAG 8-121 University of Tennessee - Knoxville 5510
 Identification and interpretation of patterns in rocket engine data
Period *Obligations*
 03/02/89-03/02/90 FY89: \$26,388 TOTAL: \$26,388
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Ali, M. MSFC/Vallely, D. P. 41-Aero Engr
 MSFC/Fox, T. H.

NAG 8-132 University of Tennessee - Knoxville 5511
 Droplet behavior at supercritical pressures
Period *Obligations*
 09/29/89-09/29/90 FY89: \$69,769 TOTAL: \$69,769
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Jeng, S. M. MSFC/Eskridge, R. H. 46-Mech Engr
 MSFC/Bachtel, F. D.

NAG 8-630 University of Tennessee - Knoxville 5512
 Integration and interpretation of multisensory data in autonomous robotic time varying inspection and manipulation for space applications
Period *Obligations*
 05/01/87-10/31/87 FY89: TOTAL: \$26,130
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Green, W. L. MSFC/Scott, D. R. 49-Engr, NEC
 Abidi, M. A. MSFC/Turner, J. R.

NAG 8-721 University of Tennessee - Knoxville 5513
 Development of Fault monitoring and diagnosis expert system for space power distribution systems
Period *Obligations*
 06/01/88-09/30/89 FY89: TOTAL: \$45,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Lee, S. MSFC/Lollar, L. F. 45-Elec Engr
 Ali, M. MSFC/Walls, B.

NAG 9-58 University of Tennessee - Knoxville 5514
 Petrologic studies of meteorite groups
Period *Obligations*
 04/01/83-04/01/90 FY89: \$56,000 TOTAL: \$277,940
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 McSween, H. Y. JSC/Browne, I. D. 32-Geological Sci
 Misra, K. C.

NAG 9-62 University of Tennessee - Knoxville 5515
 The evolution of ancient planetary crusts
Period *Obligations*
 02/01/83-02/01/90 FY89: \$100,000 TOTAL: \$701,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Taylor, L. A. JSC/Browne, I. D. 32-Geological Sci
 Hunter, R.
 Shervais, J.

NAG 9-336 University of Tennessee - Knoxville 5516
 Crust mantle interactions in planetary evolution
Period *Obligations*
 02/01/89-01/31/90 FY89: \$30,000 TOTAL: \$30,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Taylor, L. A. JSC/Browne, I. D. 19-Phys Sci, NEC

NAG 9-367 University of Tennessee - Knoxville 5517
 Gematological parameters in microgravity
Period *Obligations*
 05/01/89-05/01/90 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Lange, R. D. JSC/Cintron, N. M. 56-Medical Sciences

NAGW 125 University of Tennessee - Knoxville 5518
 Spectroscopy of methane for the atmospheres of the outer planets
Period *Obligations*
 03/01/81-09/30/89 FY89: \$105,995 TOTAL: \$567,629
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Fox, K. HQ-EL/Bergstrahl, J. T. 31-Atmos Sci
 HQ-EL/Quaide, W. L.

NAGW 863 University of Tennessee - Knoxville 5519
 Nonlinear wave vacillation in the atmosphere
Period *Obligations*
 01/01/86-12/31/89 FY89: \$36,292 TOTAL: \$250,856
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Antar, B. N. HQ-EE/Kakar, R. K. 31-Atmos Sci
 HQ-EE/Theon, J. S.

NAG10-46 University of Tennessee - Knoxville 5520
 Develop a flow solver for general compressible flow by computer modeling
Period *Obligations*
 08/12/88-03/12/89 FY89: TOTAL: \$7,120
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Chang, H. KSC/Belton, C. 99-Multi-Discip

NASA'S UNIVERSITY PROGRAM
TENNESSEE (Continued)

NAS 3-25359 University of Tennessee - Knoxville 5521
 Outreach definition study thermoacoustic convection heat transfer
Period Obligations
 08/01/88-07/31/90 FY89: TOTAL: \$99,452
Prin. Invest. NASA Tech. Officer CASE Category
 Parang, M. LERC/Chai, A. 49-Engr, NEC

NAS 8-36220 University of Tennessee - Knoxville 5522
 Computational design of an experimental laser powered thruster
Period Obligations
 09/09/86-03/08/88 FY89: TOTAL: \$70,000
Prin. Invest. NASA Tech. Officer CASE Category
 Jeng, S. MSFC/Esbridge, R. 19-Phys Sci, NEC
 Keefer, D. MSFC/Monk, J.

NAS 8-36555 University of Tennessee - Knoxville 5523
 Comprehensive software for Space Shuttle main engine flow analysis
Period Obligations
 03/14/86-11/14/89 FY89: TOTAL: \$179,990
Prin. Invest. NASA Tech. Officer CASE Category
 Reddy, K. C. MSFC/Holland, R. L. 31-Atmos Sci
 MSFC/Costes, N. C.

NAS 8-37129 University of Tennessee - Knoxville 5524
 Natural environment analysis
Period Obligations
 05/29/87-05/28/90 FY89: \$80,000 TOTAL: \$205,000
Prin. Invest. NASA Tech. Officer CASE Category
 Frost, W. MSFC/Jasper, G. L. 31-Atmos Sci

NAS 8-37292 University of Tennessee - Knoxville 5525
 Casting and solidification technology investigation
Period Obligations
 12/12/86-12/12/90 FY89: \$155,000 TOTAL: \$715,000
Prin. Invest. NASA Tech. Officer CASE Category
 Makay, M. H. MSFC/Ruff, R. 47-Materials Engr
 Makay, T.

NGT 00-050-360 University of Tennessee - Knoxville 5526
 NASA graduate student researchers program
Period Obligations
 08/01/88-07/31/89 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
 Jeng, S. M. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 43-001-807 University of Tennessee - Knoxville 5527
 NASA graduate student researchers program
Period Obligations
 09/01/85-02/28/89 FY89: TOTAL: \$53,000
Prin. Invest. NASA Tech. Officer CASE Category
 Ali, M. HQ-LE/Owens, F. C. 99-Multi-Discip

NAS 2-11586 University of Tennessee - Memphis 5528
 Regulation of erythropoiesis in mice during space flight
Period Obligations
 10/01/82-12/31/87 FY89: TOTAL: \$530,800
Prin. Invest. NASA Tech. Officer CASE Category
 Lange, R. D. ARC/Schatte, C. L. 51-Biological Sci
 ARC/Schmidt, G. K.

NAG 1-770 Vanderbilt University 5529
 Temperature and concentration measurement in a Mach 2 supersonic combustor by excimer pumped vibrational Raman scattering
Period Obligations
 05/20/87-12/31/89 FY89: \$120,000 TOTAL: \$179,997
Prin. Invest. NASA Tech. Officer CASE Category
 Pitz, R. W. LARC/Wortham, G. B. 41-Aero Engr
 Bowling, J. LARC/Jarrett, O.

NAG 1-878 Vanderbilt University 5530
 Analysis of aerothermodynamic experiments that may be conducted with tethered satellites
Period Obligations
 06/01/88-09/30/89 FY89: \$20,440 TOTAL: \$45,419
Prin. Invest. NASA Tech. Officer CASE Category
 Potter, J. L. LARC/Wood, G. M. 49-Engr, NEC

NAG 1-921 Vanderbilt University 5531
 Rarefield flow aerodynamics
Period Obligations
 01/01/89-12/31/89 FY89: \$33,182 TOTAL: \$33,182
Prin. Invest. NASA Tech. Officer CASE Category
 Potter, J. L. LARC/Blanchard, R. C. 41-Aero Engr

NAG 5-397 Vanderbilt University 5532
 Ultraviolet observations of unusually chromospherically active giant
Period Obligations
 03/01/84-09/30/90 FY89: \$10,700 TOTAL: \$85,711
Prin. Invest. NASA Tech. Officer CASE Category
 Fekel Jr., F. C. GSFC/West, D. K. 11-Astronomy
 Simon, T.

NAG 8-116 Vanderbilt University 5533
 Robosim for academic and industrial use
Period Obligations
 01/18/89-01/18/90 FY89: \$129,925 TOTAL: \$129,925
Prin. Invest. NASA Tech. Officer CASE Category
 Cook, G. E. MSFC/Fernandez, K. R. 45-Elec Engr
 Sztipanovitz, J. MSFC/Zeanah, H.
 Johnson, L. E.

NAG 8-690 Vanderbilt University 5534
 Robot graphic simulation test bed
Period Obligations
 09/30/87-09/29/89 FY89: \$99,994 TOTAL: \$299,892
Prin. Invest. NASA Tech. Officer CASE Category
 Cook, G. E. MSFC/Fernandez, K. R. 29-Math/Cmputer, NEC
 Johnson, L. E.
 Sztipanovits, J.

NAG 8-765 Vanderbilt University 5535
 Containerless processing of refractory metals and alloys
Period Obligations
 03/01/89-02/28/90 FY89: \$170,000 TOTAL: \$170,000
Prin. Invest. NASA Tech. Officer CASE Category
 Bayuzick, R. J. MSFC/Robinson, M. B. 47-Materials Engr

NAGW 810 Vanderbilt University 5536
 The commercial development of space in metallurgical processing
Period Obligations
 09/15/85-10/31/89 FY89: \$1,749,955 TOTAL: \$5,458,490
Prin. Invest. NASA Tech. Officer CASE Category
 Bayuzik, K. Y. HQ-IC/Oran, W. 47-Materials Engr
 Sharrar, J. HQ/Whitten, R. P.

NASA'S UNIVERSITY PROGRAM
TENNESSEE (Continued)

NAGW 1707 **Vanderbilt University** **5537**
 Encapsulation of living cells as a cure of hormone deficiency states in humans
Period *Obligations*
 03/15/89-03/14/90 FY89: \$150,000 TOTAL: \$150,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Wang, T. G. HQ/Gilbert, R. L. 56-Medical Sciences
 HQ/Clarks, H. J.

NAS 8-37744 **Vanderbilt University** **5538**
 Analytical and experimental investigation of the feasibility of accelerated lifetime testing of materials exposed to an atomic oxygen beam
Period *Obligations*
 06/22/88-01/21/91 FY89: TOTAL: \$163,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Albridge, R. G. MSFC/Carruth, M. R. 13-Physics
 Tolk, N. H.

NAS 8-37748 **Vanderbilt University** **5539**
 Neutralizer and sample chamber design for the atomic oxygen simulation system (AOSS)
Period *Obligations*
 01/10/89-09/07/90 FY89: \$70,000 TOTAL: \$70,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Aldridge, R. G. MSFC/Reynolds, J. 13-Physics
 Tolk, N. H.

NAS 8-37764 **Vanderbilt University** **5540**
 Analysis of rolling contact spall life in 440c steel bearing rims
Period *Obligations*
 07/25/88-07/24/90 FY89: \$80,000 TOTAL: \$160,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Hargava, V. B. MSFC/Patterson, H. 41-Aero Engr
 MSFC/Parr, R. A.

NGT 00-050-126 **Vanderbilt University** **5541**
 NASA graduate student researchers program
Period *Obligations*
 06/01/87-05/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Haglund, R. F. HQ-LE/Owens, F. C. 13-Physics

NGT 00-050-132 **Vanderbilt University** **5542**
 NASA graduate student researchers program
Period *Obligations*
 06/01/87-05/31/89 FY89: TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Tolk, N. H. HQ-LE/Owens, F. C. 13-Physics

NGT 00-050-143 **Vanderbilt University** **5543**
 NASA graduate student researchers program
Period *Obligations*
 06/01/87-05/31/88 FY89: TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Pitz, R. W. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 00-050-263 **Vanderbilt University** **5544**
 NASA graduate student researchers program
Period *Obligations*
 08/01/88-07/31/89 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Pitz, R. W. HQ-XE/Owens, F. C. 46-Mech Engr

TEXAS

NAG 9-321 **Baylor University** **5545**
 Hypervelocity impact on ultra thin films
Period *Obligations*
 10/01/88-02/01/90 FY89: \$17,900 TOTAL: \$17,900
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Alexander, W. M. JSC/Horz, F. 13-Physics

NAGW 734 **Baylor University** **5546**
 Mechanisms of gravitropism by primary and lateral roots of higher plants
Period *Obligations*
 04/01/85-02/28/89 FY89: TOTAL: \$65,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Moore, R. HQ-EB/Halstead, T. W. 51-Biological Sci

NAGW 1041 **Baylor University** **5547**
 G effects on plant growth and development
Period *Obligations*
 02/15/87-08/14/88 FY89: TOTAL: \$21,278
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Moore, R. HQ-EB/Halstead, T. W. 51-Biological Sci

NAGW 1282 **Baylor University** **5548**
 Definition and development of lu sihu measurement sensors which integrate with cosmic dust collection systems
Period *Obligations*
 02/01/88-10/31/89 FY89: \$30,750 TOTAL: \$69,782
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Alexander, W. M. HQ-EL/Mahaffy, P. R. 19-Phys Sci, NEC
 HQ-EL/Quaide, W. L.

NAGW 1308 **Baylor University** **5549**
 Data analysis of giotto dust impact detector
Period *Obligations*
 02/01/88-01/31/89 FY89: TOTAL: \$44,276
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Alexander, W. M. HQ-EL/Brinton, H. C. 11-Astronomy

NASW 3577 **Baylor University** **5550**
 Development of a dust impact detector system
Period *Obligations*
 06/01/82-11/30/87 FY89: TOTAL: \$194,893
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Alexander, W. M. HQ-EL/Brunk, W. E. 11-Astronomy
 HQ-EL/Brinton, H. C.

NCA 2-409 **Baylor University** **5551**
 Fiber optic-based calcium sensor a feasibility study
Period *Obligations*
 05/15/89-12/01/89 FY89: \$20,000 TOTAL: \$20,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Scouten, W. H. ARC/Hines, J. W. 12-Chemistry
 ARC/Arnaud, S.

NAG 2-289 **Baylor College of Medicine** **5552**
 Etiological and countermeasure studies on sensory conflict sickness
Period *Obligations*
 03/01/84-02/28/90 FY89: \$80,000 TOTAL: \$467,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Igarashi, M. ARC/Daunton, N. G. 51-Biological Sci
 ARC/Corcoran, M. L.

**NASA'S UNIVERSITY PROGRAM
TEXAS (Continued)**

NAG 2-342 Baylor College of Medicine 5553
Otolocnia calcification process a chick embryo model
Period Obligations
03/01/85-12/31/88 FY89: TOTAL: \$78,066
Prin. Invest. NASA Tech. Officer CASE Category
Fermin, C. D. ARC/Ross, M. D. 51-Biological Sci
Igarashi, M.

NAG 2-500 Baylor College of Medicine 5554
Regulation of blood volume during space flight
Period Obligations
03/01/88-11/30/89 FY89: \$62,072 TOTAL: \$97,072
Prin. Invest. NASA Tech. Officer CASE Category
Alfrey, C. P. ARC/Mandel, A. D. 51-Biological Sci
Nachtman, R. G. ARC/Leon, H. A.

NAG 9-130 Baylor College of Medicine 5555
Physiological monitoring with magnetic resonance imaging
Period Obligations
04/01/86-04/01/90 FY89: \$113,850 TOTAL: \$346,550
Prin. Invest. NASA Tech. Officer CASE Category
Leblanc, A. JSC/Schneider, V. 56-Medical Sciences

NAGW 1691 Baylor College of Medicine 5556
‡ Gz 100% gradient centrifugation during sleep and exercise its utility
in counteracting physiological microgravity effects
Period Obligations
03/01/89-02/28/90 FY89: \$255,251 TOTAL: \$255,251
Prin. Invest. NASA Tech. Officer CASE Category
Cardus, D. HQ-E/Alexander, J. K. 56-Medical Sciences
HQ-E/Holland, D. A.

NAS 9-14662 Baylor College of Medicine 5557
Influence of the external parameters of space flight on the regulation of
blood volume
Period Obligations
06/01/75-12/01/89 FY89: TOTAL: \$765,000
Prin. Invest. NASA Tech. Officer CASE Category
Alfrey, C. JSC/Huntoon, C. L. 56-Medical Sciences

NAS 9-17589 Baylor College of Medicine 5558
Renal/fluid and electrolyte studies
Period Obligations
01/01/86-07/01/90 FY89: TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
Suki, W. JSC/Huntoon, C. 56-Medical Sciences

NAS 9-18024 Baylor College of Medicine 5559
Influence of space flight on erythrokinetics in man flight experiment 261
Period Obligations
12/01/88-12/01/89 FY89: \$95,950 TOTAL: \$95,950
Prin. Invest. NASA Tech. Officer CASE Category
Alfrey, C. P. JSC/Booker, F. 56-Medical Sciences

NAS 9-18065 Baylor College of Medicine 5560
Analysis of electrophoresis samples and antibody applications
Period Obligations
03/21/89-03/21/90 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
Atassi, M. Z. JSC/Morrison, D. 56-Medical Sciences
Welch, R. A.

NAS 9-18076 Baylor College of Medicine 5561
Magnetic resonance imaging after exposure to microgravity
Period Obligations
06/01/89-06/01/92 FY89: \$20,000 TOTAL: \$20,000
Prin. Invest. NASA Tech. Officer CASE Category
Leblanc, A. JSC/Levitan, B. 56-Medical Sciences

NGT 00-050-225 Baylor College of Medicine 5562
NASA graduate student researchers program
Period Obligations
06/01/87-05/31/89 FY89: TOTAL: \$35,300
Prin. Invest. NASA Tech. Officer CASE Category
Atassi, M. Z. HQ-XE/Owens, F. C. 56-Medical Sciences

NAG 9-286 Lamar University 5563
Assessment of the dynamic response of the space station stinger
Period Obligations
04/01/88-01/01/90 FY89: TOTAL: \$65,325
Prin. Invest. NASA Tech. Officer CASE Category
Corder, P. JSC/Hamilton, D. A. 42-Astro Engr

NAG 9-300 Lamar University 5564
Assessment of the finite element modelling assumptions relating to the
space station photovoltaic array structure
Period Obligations
06/01/88-12/01/89 FY89: TOTAL: \$49,000
Prin. Invest. NASA Tech. Officer CASE Category
Corder, P. R. JSC/Chandler, J. A. 46-Mech Engr

NAG 9-376 Lamar University 5565
Lunar volatile study
Period Obligations
05/01/89-05/01/90 FY89: \$68,739 TOTAL: \$68,739
Prin. Invest. NASA Tech. Officer CASE Category
Jordan, J. JSC/McKay, D. S. 32-Geological Sci

NAG 9-356 Le Tourneau College 5566
Silane stability to humidity and temperature
Period Obligations
04/01/89-04/01/90 FY89: \$30,000 TOTAL: \$30,000
Prin. Invest. NASA Tech. Officer CASE Category
Johnson, R. E. JSC/Albyn, K. C. 12-Chemistry

NAG 2-400 Prairie View A&M University 5567
Nitrogen transformation and gaseous n emissions in a pasture
ecosystem
Period Obligations
05/01/86-10/31/89 FY89: \$137,535 TOTAL: \$413,964
Prin. Invest. NASA Tech. Officer CASE Category
Brams, E. A. ARC/Peterson, D. L. 54-Env Biology

NAG 9-310 Prairie View A&M University 5568
Flow boiling with enhancement devices for cold plate coolant channel
design
Period Obligations
09/01/88-09/01/89 FY89: TOTAL: \$100,000
Prin. Invest. NASA Tech. Officer CASE Category
Boyd, R. D. JSC/Parish, R. 13-Physics

NAG 9-318 Prairie View A&M University 5569
Time-domain microwave imaging for robotic vision applications
Period Obligations
09/01/88-09/01/89 FY89: TOTAL: \$114,349
Prin. Invest. NASA Tech. Officer CASE Category
Tolliver, C. L. JSC/Arndt, G. D. 45-Elec Engr

NASA'S UNIVERSITY PROGRAM **TEXAS (Continued)**

NAG 9-332 **Prairie View A&M University** **5570**
 Susceptibility of most device to alpha particle
Period *Obligations*
 01/03/89-01/02/90 FY89: \$83,472 TOTAL: \$83,472
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Wang, F. C. JSC/Herman, C. 19-Phys Sci, NEC

NAG 2-579 **Rice University** **5578**
 Sesquinet and the NASA science internet
Period *Obligations*
 01/01/89-12/31/89 FY89: \$74,927 TOTAL: \$74,927
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Almes, G. T. ARC/Jones, W. P. 22-Computer Science
 ARC/Siegel, M. R.

NAG 9-337 **Prairie View A&M University** **5571**
 Minority consortium for study of space radiation on materials system and devices
Period *Obligations*
 01/03/89-01/02/90 FY89: \$117,813 TOTAL: \$117,813
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Kumar, A. A. JSC/Herman, C. 19-Phys Sci, NEC

NAG 5-262 **Rice University** **5579**
 High dispersion ultraviolet spectra abundances of carbon, silicon and magnesium in selected galactic regions
Period *Obligations*
 08/01/82-09/30/89 FY89: TOTAL: \$240,059
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Dufour, R. J. GSFC/Kondo, Y. 11-Astronomy
 Mitra, M.
 Walborn, N. R.

NAS 9-17406 **Prairie View A&M University** **5572**
 Products resulting from interations of atomic oxygen with spacecraft materials
Period *Obligations*
 08/01/85-07/31/89 FY89: TOTAL: \$194,861
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Wang, F. C. JSC/Leger, L. 47-Materials Engr

NAG 5-775 **Rice University** **5580**
 Dynamic Explorer data analysis
Period *Obligations*
 05/15/86-01/31/90 FY89: \$32,794 TOTAL: \$124,501
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Reiff, P. GSFC/Bullock, G. D. 19-Phys Sci, NEC
 GSFC/Hoffman, R. A.

NGT 44-003-900 **Prairie View A&M University** **5573**
 NASA graduate student researchers program
Period *Obligations*
 01/01/86-12/31/87 FY89: TOTAL: \$45,322
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Fanale, F. P. HQ-U/Pohly, J. 46-Mech Engr

NAG 5-1195 **Rice University** **5581**
 The solar wind interaction with Mars
Period *Obligations*
 08/01/89-07/31/90 FY89: \$4,958 TOTAL: \$4,958
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Cloutier, P. A. GSFC/Acuna, M. H. 13-Physics

NAG 1-516 **Rice University** **5574**
 Optimal flight trajectories in the presence of wind shear
Period *Obligations*
 08/09/84-11/30/89 FY89: TOTAL: \$282,895
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Miele, A. LARC/Bowles, R. L. 41-Aero Engr
 LARC/Steinmetz, G. G.

NAG 8-612 **Rice University** **5582**
 High temperature studies of levitated liquids
Period *Obligations*
 04/01/87-09/30/89 FY89: TOTAL: \$120,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Margrave, J. L. MSFC/Robinson, M. B. 11-Astronomy

NAG 1-766 **Rice University** **5575**
 Efficient algorithms for space station dynamic studies
Period *Obligations*
 06/01/87-11/30/88 FY89: TOTAL: \$49,931
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Spanos, P. D. LARC/Cooper, P. A. 42-Astro Engr

NAG 8-755 **Rice University** **5583**
 Optimal trajectories for the aeroassisted flight experiment
Period *Obligations*
 10/01/88-09/29/89 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Miele, A. MSFC/Burrows, R. R. 41-Aero Engr
 MSFC/Burns, R. E.

NAG 1-1029 **Rice University** **5576**
 Optimization and guidance of flight trajectories for the national aerospace plane
Period *Obligations*
 06/22/89-06/21/90 FY89: \$30,000 TOTAL: \$30,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Miele, A. LARC/Queen, E. M. 42-Astro Engr
 LARC/Moerder, D. D.

NAG 9-88 **Rice University** **5584**
 Gas-rich materials in carbonaceous chondrites
Period *Obligations*
 04/01/84-05/01/90 FY89: TOTAL: \$54,971
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Heymann, D. JSC/Browne, I. D. 32-Geological Sci

NAG 2-566 **Rice University** **5577**
 Data reduction and analysis of Pioneer Venus orbital ion mass spectrometer
Period *Obligations*
 10/01/88-09/30/89 FY89: \$230,000 TOTAL: \$230,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Cloutier, P. A. ARC/Lasher, L. E. 11-Astronomy
 ARC/Fimmel, R. O.

NAG 9-100 **Rice University** **5585**
 Origin of the solar system: Isotopic and chemical anomalies
Period *Obligations*
 05/01/85-12/01/89 FY89: \$22,480 TOTAL: \$150,966
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Clayton, D. D. JSC/Browne, I. D. 11-Astronomy

NASA'S UNIVERSITY PROGRAM **TEXAS (Continued)**

NAG 9-123	Rice University		5586
	Imagery and spectroscopy of supernova remnants and other stellar ejected nebulae		
	<i>Period</i>	<i>Obligations</i>	
	08/16/85-08/05/90	FY89: \$29,380	TOTAL: \$103,337
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Dufour, R. J.	JSC/Parker, R. A.	47-Materials Engr
NAG 9-207	Rice University		5587
	Fundamental studies in mammalian cell culture bioreactor scale up operation and control		
	<i>Period</i>	<i>Obligations</i>	
	03/01/87-05/01/89	FY89:	TOTAL: \$55,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	McIntire, I. V.	JSC/Wolf, D.	56-Medical Sciences
NAG 9-208	Rice University		5588
	Research on robotics and automation for space applications		
	<i>Period</i>	<i>Obligations</i>	
	03/01/87-08/01/89	FY89:	TOTAL: \$220,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	De Figueiredo, R.	JSC/Price, C.	41-Aero Engr
NAG 9-209	Rice University		5589
	Atomic collision processes relevant to space flight		
	<i>Period</i>	<i>Obligations</i>	
	03/01/87-03/01/89	FY89:	TOTAL: \$110,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Smith, K. A.	JSC/Visentine, J. T.	13-Physics
NAG 9-282	Rice University		5590
	Deterioration of less common metallic systems in certain environments		
	<i>Period</i>	<i>Obligations</i>	
	04/01/88-07/01/89	FY89:	TOTAL: \$81,383
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Brotzen, F. R.	JSC/Horiuchi, G. K.	47-Materials Engr
	McLellan, R. B.		
NAG 9-305	Rice University		5591
	Sodium in Mercury's exosphere		
	<i>Period</i>	<i>Obligations</i>	
	09/01/88-05/01/89	FY89:	TOTAL: \$4,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Killen, R. M.	JSC/Potter, A.	11-Astronomy
NAG 9-349	Rice University		5592
	Response of a dual plate meteoroid shield subjected to hypervelocity impacts		
	<i>Period</i>	<i>Obligations</i>	
	05/01/89-05/01/90	FY89: \$30,855	TOTAL: \$30,855
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Angel, Y. C.	JSC/Palais, B. G.	46-Mech Engr
NAG 9-358	Rice University		5593
	Modeling the surface and interior structure of comet nuclei using a multidisciplinary approach		
	<i>Period</i>	<i>Obligations</i>	
	05/01/89-05/01/90	FY89: \$62,123	TOTAL: \$62,123
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	O'dell, C. R.	JSC/Gooding, J. L.	11-Astronomy
	Dakoulas, P.		
	Pharr, G. M.		
NAG 9-359	Rice University		5594
	Deterioration of less common metallic systems in certain environments		
	<i>Period</i>	<i>Obligations</i>	
	07/01/89-07/01/90	FY89: \$83,458	TOTAL: \$83,458
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Brotzen, F. R.	JSC/Horiuchi, G. K.	47-Materials Engr
	McLellan, R. B.		
NAG 9-372	Rice University		5595
	A telepresence mobile robotic system		
	<i>Period</i>	<i>Obligations</i>	
	05/15/89-05/14/90	FY89: \$87,338	TOTAL: \$87,338
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Cheatham, J. B.	JSC/Galicki, P.	46-Mech Engr
NAG 9-392	Rice University		5596
	Multibody dynamics in robotics		
	<i>Period</i>	<i>Obligations</i>	
	07/01/89-03/01/90	FY89: \$15,875	TOTAL: \$15,875
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Spanos, P. D.	JSC/Berka, R. B.	46-Mech Engr
NAGW 379	Rice University		5597
	Theoretical study of pulsar magnetospheres		
	<i>Period</i>	<i>Obligations</i>	
	11/01/82-10/31/89	FY89:	TOTAL: \$182,573
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Michel, F. C.	HQ-E/Rosendhal, J. D.	11-Astronomy
		HQ-EP/Konkel, R. M.	
NAGW 482	Rice University		5598
	Three-dimensional structure of the Earth's electromagnetic field		
	<i>Period</i>	<i>Obligations</i>	
	07/01/83-03/31/90	FY89: \$170,237	TOTAL: \$1,120,974
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Hill, T. W.	HQ-ES/Mellott, M. M.	39-Env Sci, NEC
		HQ-EE/Curtis, S. A.	
NAGW 1151	Rice University		5599
	A test of the hypothesis of differential rotation in the magnetic field of Jupiter		
	<i>Period</i>	<i>Obligations</i>	
	09/01/87-08/31/89	FY89: \$65,000	TOTAL: \$125,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Dessler, A. J.	HQ-ES/Mellott, M. M.	13-Physics
		HQ-EE/Eastman, T. E.	
NAGW 1416	Rice University		5600
	The magnetosphere of Uranus data analysis and model calculations		
	<i>Period</i>	<i>Obligations</i>	
	11/01/88-10/31/89	FY89:	TOTAL: \$70,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Dessler, A. J.	HQ-ES/Mellott, M. M.	13-Physics
		HQ-ES/Perry, T. W.	
NAGW 1628	Rice University		5601
	Atmospheres to Moon and Mercury		
	<i>Period</i>	<i>Obligations</i>	
	02/01/89-01/31/90	FY89: \$25,000	TOTAL: \$25,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Killen, R.	HQ-EL/Bergstralh, J. T.	11-Astronomy

**NASA'S UNIVERSITY PROGRAM
TEXAS (Continued)**

NAS 5-28764	Rice University	5602	Analysis of Pioneer, Venus and related interplanetary data <i>Period</i> 07/01/85-12/31/89 <i>Prin. Invest.</i> Cloutier, P.	<i>Obligations</i> FY89: \$53,000 NASA Tech. Officer GSFC/Taylor, H. A. GSFC/Gagnon, B.	TOTAL: \$270,578 <i>CASE Category</i> 31-Atmos Sci
NAS 5-29451	Rice University	5603	The Hubble space telescope guaranteed time observation program <i>Period</i> 09/24/86-05/31/90 <i>Prin. Invest.</i> O'dell, C. R.	<i>Obligations</i> FY89: \$90,000 NASA Tech. Officer GSFC/Kalinowski, J. K.	TOTAL: \$268,000 <i>CASE Category</i> 42-Astro Engr
NGT 00-050-071	Rice University	5604	NASA graduate student researchers program <i>Period</i> 09/01/86-08/31/89 <i>Prin. Invest.</i> De Figueiredo, R.	<i>Obligations</i> FY89: NASA Tech. Officer HQ-LE/Owens, F. C.	TOTAL: \$46,300 <i>CASE Category</i> 45-Elec Engr
NGT 00-050-251	Rice University	5605	NASA graduate student researchers program <i>Period</i> 09/14/87-09/13/89 <i>Prin. Invest.</i> Haymes, R. C.	<i>Obligations</i> FY89: NASA Tech. Officer HQ-XE/Owens, F. C.	TOTAL: \$35,850 <i>CASE Category</i> 13-Physics
NGT 00-050-379	Rice University	5606	NASA graduate student researchers program <i>Period</i> 08/01/88-07/31/90 <i>Prin. Invest.</i> De Figueiredo, R.	<i>Obligations</i> FY89: \$18,000 NASA Tech. Officer HQ-XE/Owens, F. C.	TOTAL: \$36,000 <i>CASE Category</i> 45-Elec Engr
NGT 00-050-447	Rice University	5607	NASA graduate student researchers program <i>Period</i> 07/01/89-08/30/90 <i>Prin. Invest.</i> Johnson, D. H.	<i>Obligations</i> FY89: \$16,400 NASA Tech. Officer HQ-XE/Owens, F. C.	TOTAL: \$16,400 <i>CASE Category</i> 45-Elec Engr
NGT 44-006-807	Rice University	5608	NASA graduate student researchers program <i>Period</i> 06/01/85-05/31/89 <i>Prin. Invest.</i> Johnson, D. H.	<i>Obligations</i> FY89: NASA Tech. Officer HQ-LE/Owens, F. C.	TOTAL: \$56,300 <i>CASE Category</i> 45-Elec Engr
NSG 7043	Rice University	5609	Research on planetary atmospheres <i>Period</i> 03/01/74-10/31/89 <i>Prin. Invest.</i> Chamberlain, J. W.	<i>Obligations</i> FY89: \$52,150 NASA Tech. Officer HQ-EL/Bergstralh, J. T. HQ-EL/Quaide, W. L.	TOTAL: \$773,204 <i>CASE Category</i> 31-Atmos Sci
NSG 7386	Rice University	5610	Study of ion-molecule reactions of importance in planetary atmosphere <i>Period</i> 09/01/77-10/31/89 <i>Prin. Invest.</i> Stebbins, R. F.	<i>Obligations</i> FY89: \$40,000 NASA Tech. Officer HQ-EL/Bergstralh, J. T. HQ-EL/Quaide, W. L.	TOTAL: \$453,139 <i>CASE Category</i> 31-Atmos Sci
NAGW 459	Southern Methodist University	5611	Planetary interior modeling and tectonic implications <i>Period</i> 06/01/83-12/31/89 <i>Prin. Invest.</i> Phillips, R. J.	<i>Obligations</i> FY89: \$148,156 NASA Tech. Officer HQ-EL/Underwood, J. R. HQ-EL/Boyce, J. M.	TOTAL: \$446,357 <i>CASE Category</i> 32-Geological Sci
NAGW 1085	Southern Methodist University	5612	Tectonic evolution of Mars <i>Period</i> 05/01/87-04/30/90 <i>Prin. Invest.</i> Phillips, R. J.	<i>Obligations</i> FY89: \$55,000 NASA Tech. Officer HQ-EL/Underwood, J. R. HQ-EL/Boyce, J. M.	TOTAL: \$165,000 <i>CASE Category</i> 32-Geological Sci
NGT 00-050-536	Southern Methodist University	5613	NASA graduate student researchers program <i>Period</i> 08/21/89-08/20/90 <i>Prin. Invest.</i> Dula, J. H.	<i>Obligations</i> FY89: \$18,000 NASA Tech. Officer HQ-XE/Owens, F. C.	TOTAL: \$18,000 <i>CASE Category</i> 49-Engr, NEC
NAG 1-631	Southwest Texas State University	5614	Trifluoromethyl substituted polyimides <i>Period</i> 01/15/86-01/14/90 <i>Prin. Invest.</i> Cassidy, P. E.	<i>Obligations</i> FY89: \$49,938 NASA Tech. Officer LARC/St Clair, A. K. LARC/Stoakley, D. M.	TOTAL: \$174,328 <i>CASE Category</i> 12-Chemistry
NAGW 605	Sul Ross State University	5615	Galelean satellite mapping program <i>Period</i> 03/01/84-10/31/89 <i>Prin. Invest.</i> Whitford-stark H, J. L.	<i>Obligations</i> FY89: \$14,000 NASA Tech. Officer HQ-EL/Underwood, J. R. HQ-EL/Boyce, J. M.	TOTAL: \$39,487 <i>CASE Category</i> 32-Geological Sci
NAG 1-1010	Texas A&I University	5616	Physics of tethered satellite deployment <i>Period</i> 05/09/89-11/30/89 <i>Prin. Invest.</i> Coy, P. H.	<i>Obligations</i> FY89: \$29,499 NASA Tech. Officer LARC/Deloach, R.	TOTAL: \$29,499 <i>CASE Category</i> 13-Physics
NAG 9-331	Texas A&I University	5617	Space radiation on materials systems and devices <i>Period</i> 01/15/89-01/14/90 <i>Prin. Invest.</i> Linder, J. S.	<i>Obligations</i> FY89: \$54,014 NASA Tech. Officer JSC/Herman, C.	TOTAL: \$54,014 <i>CASE Category</i> 31-Atmos Sci

NASA'S UNIVERSITY PROGRAM **TEXAS (Continued)**

NGT 00-070-132 Texas A&I University 5618
 NASA graduate student researchers underrepresented minority focus program

<i>Period</i>	<i>Obligations</i>	
07/01/89-06/30/90	FY89: \$18,000	TOTAL: \$18,000
<i>Prin. Invest.</i>	NASA Tech. Officer	<i>CASE Category</i>
Linder, J. S.	HQ-XE/Owens, F. C.	45-Elec Engr

NGT 00-070-133 Texas A&I University 5619
 NASA graduate student researchers underrepresented minority focus program

<i>Period</i>	<i>Obligations</i>	
07/01/89-08/30/90	FY89: \$18,000	TOTAL: \$18,000
<i>Prin. Invest.</i>	NASA Tech. Officer	<i>CASE Category</i>
Linder, J. S.	HQ-XE/Owens, F. C.	45-Elec Engr

NAG 1-793 Texas A&M University System 5620
 An initial investigation into methods of computing transonic aerodynamic sensitivity coefficients

<i>Period</i>	<i>Obligations</i>	
07/01/87-12/31/89	FY89:	TOTAL: \$51,399
<i>Prin. Invest.</i>	NASA Tech. Officer	<i>CASE Category</i>
Carlson, L. A.	LARC/Yates, E. C.	41-Aero Engr
	LARC/Dwyer, D. L.	

NAG 3-820 Texas A&M University System 5621
 Impact of advanced power systems of the evolutionary space station

<i>Period</i>	<i>Obligations</i>	
09/15/87-05/31/88	FY89:	TOTAL: \$49,496
<i>Prin. Invest.</i>	NASA Tech. Officer	<i>CASE Category</i>
Peddricord, K. L.	LERC/Stubbs, R. M.	49-Engr, NEC

NAG 3-944 Texas A&M University System 5622
 Accomod of nuclear components

<i>Period</i>	<i>Obligations</i>	
10/15/88-10/15/89	FY89: \$75,000	TOTAL: \$75,000
<i>Prin. Invest.</i>	NASA Tech. Officer	<i>CASE Category</i>
Peddricord, K. L.	LERC/Stevenson, S. M.	49-Engr, NEC

NAG 9-326 Texas A&M University System 5623
 Local sensory control of a dexterous end effector

<i>Period</i>	<i>Obligations</i>	
01/01/89-01/01/90	FY89: \$71,221	TOTAL: \$71,221
<i>Prin. Invest.</i>	NASA Tech. Officer	<i>CASE Category</i>
Driels, M.	JSC/Li, L. C.	99-Multi-Discip

NAS 8-37284 Texas A&M University System 5624
 Tropical pacific moisture variability hs detection synoptic structure and consequences in the general circulation

<i>Period</i>	<i>Obligations</i>	
12/05/86-05/31/90	FY89: \$100,000	TOTAL: \$309,700
<i>Prin. Invest.</i>	NASA Tech. Officer	<i>CASE Category</i>
McGuirk, J. P.	MSFC/Kaufman, J. W.	31-Atmos Sci
Thompson, A. H.	MSFC/Fichtl, G. H.	

NAG 1-619 Texas A&M University 5625
 Development of a direct inverse 3-D method for applied transonic aerodynamic design and analysis

<i>Period</i>	<i>Obligations</i>	
10/15/85-08/31/89	FY89:	TOTAL: \$128,341
<i>Prin. Invest.</i>	NASA Tech. Officer	<i>CASE Category</i>
Carlson, L. A.	LARC/Campbell, R. L.	41-Aero Engr
	LARC/Waggoner, E. G.	

NAG 1-630 Texas A&M University 5626
 Rectangular sybsonic jet flowfield study

<i>Period</i>	<i>Obligations</i>	
01/01/86-09/30/89	FY89:	TOTAL: \$163,845
<i>Prin. Invest.</i>	NASA Tech. Officer	<i>CASE Category</i>
Morrison, G. L.	LARC/Seiner, J. M.	41-Aero Engr
	LARC/Ponton, M. K.	

NAG 1-644 Texas A&M University 5627
 Energy dissipation in a rolling aircraft tire

<i>Period</i>	<i>Obligations</i>	
03/01/86-09/30/88	FY89:	TOTAL: \$122,097
<i>Prin. Invest.</i>	NASA Tech. Officer	<i>CASE Category</i>
Tielking, J. T.	LARC/Tanner, J. A.	44-Civil Engr
	LARC/Stroud, W. J.	

NAG 1-659 Texas A&M University 5628
 Micromechanics of composite laminate compressive failure

<i>Period</i>	<i>Obligations</i>	
04/01/86-09/30/89	FY89:	TOTAL: \$173,156
<i>Prin. Invest.</i>	NASA Tech. Officer	<i>CASE Category</i>
Bradley, W. L.	LARC/Whitcomb, J. D.	47-Materials Engr
	LARC/Harris, C. E.	

NAG 1-711 Texas A&M University 5629
 The influence on laminate strength of wavy layers

<i>Period</i>	<i>Obligations</i>	
10/15/86-04/14/89	FY89:	TOTAL: \$54,742
<i>Prin. Invest.</i>	NASA Tech. Officer	<i>CASE Category</i>
Highsmith, A. L.	LARC/Whitcomb, J. D.	47-Materials Engr

NAG 1-781 Texas A&M University 5630
 Feasibility of using a compensated variometer on a commercial airliner to measure wind shear

<i>Period</i>	<i>Obligations</i>	
06/17/87-07/16/88	FY89:	TOTAL: \$42,345
<i>Prin. Invest.</i>	NASA Tech. Officer	<i>CASE Category</i>
Ward, D. T.	LARC/Hinton, D. A.	41-Aero Engr
Nicks, O. W.	LARC/Oseguera, R. M.	

NAG 1-891 Texas A&M University 5631
 Shock wave boundary layer interaction studies for hypersonic inlet applications

<i>Period</i>	<i>Obligations</i>	
06/15/88-03/31/90	FY89: \$74,998	TOTAL: \$112,998
<i>Prin. Invest.</i>	NASA Tech. Officer	<i>CASE Category</i>
Lu, F. K.	LARC/Weidner, J. P.	41-Aero Engr
Wilson, D. R.	LARC/MacKley, E. A.	

NAG 1-911 Texas A&M University 5632
 Effect of atmospherics on beamforming accuracy

<i>Period</i>	<i>Obligations</i>	
10/01/88-01/15/90	FY89: \$58,716	TOTAL: \$58,716
<i>Prin. Invest.</i>	NASA Tech. Officer	<i>CASE Category</i>
Alexander, R. M.	LARC/Willshire, W. L.	13-Physics

NAG 1-916 Texas A&M University 5633
 Modelling of total energy variometer used to measure wind shear on a commercial airliner

<i>Period</i>	<i>Obligations</i>	
10/01/88-10/31/89	FY89: \$16,000	TOTAL: \$16,000
<i>Prin. Invest.</i>	NASA Tech. Officer	<i>CASE Category</i>
Ward, D. T.	LARC/Hinton, D. A.	41-Aero Engr
	LARC/Oseguera, R. M.	

NASA'S UNIVERSITY PROGRAM
TEXAS (Continued)

NAG 1-979 Texas A&M University 5634
 A life prediction model for laminated composite structural components
Period Obligations
 04/01/89-03/31/90 FY89: \$25,419 TOTAL: \$25,419
Prin. Invest. NASA Tech. Officer CASE Category
 Allen, D. H. LARC/Harris, C. E. 46-Mech Engr

NAG 1-1003 Texas A&M University 5635
 Nonequilibrium radiation and chemistry models for aero capture vehicle flowfields
Period Obligations
 06/07/89-06/06/90 FY89: \$69,966 TOTAL: \$69,966
Prin. Invest. NASA Tech. Officer CASE Category
 Carlson, L. A. LARC/Hartung, L. C. 41-Aero Engr

NAG 1-1062 Texas A&M University 5636
 Analysis of energy balance models using the ERBE data set Earth radiation budget experiment
Period Obligations
 09/21/89-09/20/90 FY89: \$42,411 TOTAL: \$42,411
Prin. Invest. NASA Tech. Officer CASE Category
 Graves, C. E. LARC/Smith, G. L. 31-Atmos Sci
 North, G. R.

NAG 3-181 Texas A&M University 5637
 Compressible and incompressible fluid seals: Influence on rotordynamic response and stability
Period Obligations
 06/01/81-04/28/90 FY89: \$250,000 TOTAL: \$1,530,352
Prin. Invest. NASA Tech. Officer CASE Category
 Childs, D. W. LERC/Hendricks, R. C. 46-Mech Engr
 Nelson, C. C.
 Morrison, G.

NAG 3-354 Texas A&M University 5638
 Study of propeller aeroacoustic methodologies
Period Obligations
 11/15/82-09/30/89 FY89: \$40,000 TOTAL: \$389,526
Prin. Invest. NASA Tech. Officer CASE Category
 Korkan, K. D. LERC/Dittmar, J. H. 41-Aero Engr
 LERC/Groeneweg, J. F.

NAG 3-626 Texas A&M University 5639
 Experimental study of performance degradation of a rotating system in the NASA Lewis icing tunnel
Period Obligations
 04/25/85-01/15/89 FY89: \$46,125 TOTAL: \$699,059
Prin. Invest. NASA Tech. Officer CASE Category
 Korkan, K. D. LERC/Reinmann, J. J. 41-Aero Engr

NAG 3-702 Texas A&M University 5640
 Measurement of elastic modulus and damping of small size specimens as a function of temperature
Period Obligations
 03/01/86-05/31/89 FY89: TOTAL: \$138,465
Prin. Invest. NASA Tech. Officer CASE Category
 Wolfenden, A. LERC/Whittenberger, J. D. 47-Materials Engr

NAG 3-763 Texas A&M University 5641
 Active control of transients rotor vibrations
Period Obligations
 01/02/87-02/28/90 FY89: \$40,000 TOTAL: \$98,958
Prin. Invest. NASA Tech. Officer CASE Category
 Palazzolo, A. B. LERC/Kascak, A. F. 46-Mech Engr

NAG 3-846 Texas A&M University 5642
 Embedded optical sensors for structural materials
Period Obligations
 12/10/87-12/10/89 FY89: \$50,000 TOTAL: \$100,000
Prin. Invest. NASA Tech. Officer CASE Category
 Taylor, H. F. LERC/Madzsar, G. C. 49-Engr, NEC

NAG 3-891 Texas A&M University 5643
 Cryogenic dampers verification
Period Obligations
 04/01/88-03/30/90 FY89: \$97,000 TOTAL: \$195,004
Prin. Invest. NASA Tech. Officer CASE Category
 Palazzolo, A. B. LERC/Kascak, A. F. 46-Mech Engr

NAG 3-1043 Texas A&M University 5644
 Modeling study of the maximum power density attainable in a hydrogen/oxygen fuel cell
Period Obligations
 05/05/89-05/04/90 FY89: \$99,000 TOTAL: \$99,000
Prin. Invest. NASA Tech. Officer CASE Category
 White, R. E. LERC/Hagedorn, N. H. 49-Engr, NEC
 Appleby, A. J.
 Srinivasan, S.

NAG 5-655 Texas A&M University 5645
 Balloon materials science and engineering
Period Obligations
 03/01/89-02/28/90 FY89: \$120,493 TOTAL: \$120,493
Prin. Invest. NASA Tech. Officer CASE Category
 Noel, J. GSFC/Needleman, H. C. 19-Phys Sci, NEC
 GSFC/Early, L. J.

NAG 5-868 Texas A&M University 5646
 Large scale climate prediction algorithms test
Period Obligations
 02/01/87-03/31/90 FY89: \$75,000 TOTAL: \$226,168
Prin. Invest. NASA Tech. Officer CASE Category
 North, G. R. GSFC/Lau, W. K. 31-Atmos Sci

NAG 5-869 Texas A&M University 5647
 Statistical research for precipitation in space
Period Obligations
 02/01/87-12/31/89 FY89: \$150,000 TOTAL: \$375,000
Prin. Invest. NASA Tech. Officer CASE Category
 North, G. R. GSFC/Bell, T. L. 31-Atmos Sci

NAG 9-140 Texas A&M University 5648
 A study of material damping
Period Obligations
 04/01/86-06/01/88 FY89: TOTAL: \$48,163
Prin. Invest. NASA Tech. Officer CASE Category
 Allen, D. H. JSC/Holder, B. W. 41-Aero Engr
 Harris, C. E.
 Highsmith, A. L.

NAG 9-143 Texas A&M University 5649
 Advanced power system protection and incipient Fault detection
Period Obligations
 04/01/86-06/01/88 FY89: TOTAL: \$60,000
Prin. Invest. NASA Tech. Officer CASE Category
 Russell, B. D. JSC/Hackler, I. M. 45-Elec Engr

NASA'S UNIVERSITY PROGRAM **TEXAS (Continued)**

NAG 9-148	Texas A&M University	5650
Optimal control of an aerobraking orbital transfer vehicle subject to atmospheric density variations		
<i>Period</i>	<i>Obligations</i>	
04/15/86-09/01/88	FY89: TOTAL: \$45,431	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Ward, D. T.	JSC/Whitnah, M. A.	41-Aero Engr
NAG 9-150	Texas A&M University	5651
Single crystal growth and characterization of ilmenite FeO-TiO ₂ and other Fe Ti O ₂ compounds		
<i>Period</i>	<i>Obligations</i>	
04/14/86-07/14/88	FY89: TOTAL: \$109,998	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Pandey, R. K.	JSC/Williams, R. J.	45-Elec Engr
NAG 9-173	Texas A&M University	5652
New secondary batteries utilizing electronically conductive polymer cathodes		
<i>Period</i>	<i>Obligations</i>	
09/01/86-02/01/90	FY89: \$67,033 TOTAL: \$138,577	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Martin, C. R.	JSC/Darcy, E.	43-Chem Engr
White, R. E.	JSC/Bragg, B.	
NAG 9-177	Texas A&M University	5653
Optimization of the lithium thionyl chloride battery		
<i>Period</i>	<i>Obligations</i>	
09/01/86-01/01/90	FY89: \$37,700 TOTAL: \$98,190	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
White, R. E.	JSC/Darcy, E.	45-Elec Engr
NAG 9-192	Texas A&M University	5654
This grant consists of nine interdisciplinary projects		
<i>Period</i>	<i>Obligations</i>	
01/06/87-02/01/89	FY89: TOTAL: \$562,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Young, T.	JSC/Henry, M. F.	49-Engr, NEC
NAG 9-194	Texas A&M University	5655
Plume interference studies		
<i>Period</i>	<i>Obligations</i>	
03/01/87-04/01/89	FY89: TOTAL: \$54,272	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Anderson, D. A.	JSC/Li, C.	41-Aero Engr
NAG 9-253	Texas A&M University	5656
Conceptual design for a food production water waste processing and gas regeneration module		
<i>Period</i>	<i>Obligations</i>	
09/01/87-02/01/89	FY89: TOTAL: \$285,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Wolfe, J. C.	JSC/Cullingford, H. S.	59-Life Sci, NEC
NAG 9-266	Texas A&M University	5657
Hollow cathode plasma wave turbulence experiments		
<i>Period</i>	<i>Obligations</i>	
01/05/88-08/31/88	FY89: TOTAL: \$14,830	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hite, G.	JSC/McCoy, J. E.	13-Physics
NAG 9-275	Texas A&M University	5658
Design of an optimal pointing system for space solar dynamics system		
<i>Period</i>	<i>Obligations</i>	
06/01/88-06/01/90	FY89: TOTAL: \$58,354	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Parlos, A. G.	JSC/Sunkel, J. W.	49-Engr, NEC
NAG 9-276	Texas A&M University	5659
Improving thermal contact conductance through the use of thin metallic coatings		
<i>Period</i>	<i>Obligations</i>	
02/21/88-02/20/90	FY89: TOTAL: \$44,726	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Peterson, G. P.	JSC/Lin, C. H.	46-Mech Engr
NAG 9-280	Texas A&M University	5660
Failure prediction of thin beryllium sheers used in spacecraft structures		
<i>Period</i>	<i>Obligations</i>	
07/01/88-07/01/90	FY89: TOTAL: \$64,951	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Roschke, P. N.	JSC/Castner, W. L.	47-Materials Engr
NAG 9-283	Texas A&M University	5661
Modern biofuel cells for waste recycling in life support systems		
<i>Period</i>	<i>Obligations</i>	
04/01/88-10/01/89	FY89: TOTAL: \$70,411	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Bockris, J. O.	JSC/Price, D. F.	12-Chemistry
NAG 9-289	Texas A&M University	5662
Electrochemical processing of solid waste		
<i>Period</i>	<i>Obligations</i>	
02/21/88-12/01/89	FY89: \$6,227 TOTAL: \$76,638	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Bockris, J. O.	JSC/Thompson, D. R.	12-Chemistry
NAG 9-303	Texas A&M University	5663
Characterization of slow and fast phase myastagmus		
<i>Period</i>	<i>Obligations</i>	
08/01/88-08/01/90	FY89: \$39,600 TOTAL: \$131,330	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Lessard, C. S.	JSC/Kutyna, F. A.	51-Biological Sci
	JSC/Bungo, M.	
NAG 9-347	Texas A&M University	5664
Controller synthesis for disturbance rejection of system subjected to structural vibration		
<i>Period</i>	<i>Obligations</i>	
06/01/89-06/01/90	FY89: \$71,368 TOTAL: \$71,368	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Parlos, A. G.	JSC/Sunkel, J. W.	46-Mech Engr
Jayasuria, S.		
NAG 9-350	Texas A&M University	5665
Selective removal of organics for water retention		
<i>Period</i>	<i>Obligations</i>	
04/01/89-03/31/90	FY89: \$58,851 TOTAL: \$58,851	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Murphy, O. J.	JSC/Verostko, C. E.	43-Chem Engr
Hitchens, G. D.		

NASA'S UNIVERSITY PROGRAM **TEXAS (Continued)**

NAG 9-362	Texas A&M University	5666	Bilateral control of dextrous end effectors	NAGW 1779	Texas A&M University	5674	The electrochemical incineration of human wastes in confined spaces
<i>Period</i> 10/01/89-10/01/90	<i>Obligations</i> FY89: \$59,217	TOTAL: \$59,217	<i>Prin. Invest.</i> Ornels, M. R.	<i>Period</i> 09/01/89-08/31/90	<i>Obligations</i> FY89: \$99,237	TOTAL: \$99,237	<i>Prin. Invest.</i> Brockis, J. O.
	<i>NASA Tech. Officer</i> JSC/Johnson, D. A.	<i>CASE Category</i> 46-Mech Engr			<i>NASA Tech. Officer</i> HQ-RP/Evanich, P. L. JSC/Behrend, A. F.	<i>CASE Category</i> 43-Chem Engr	
NAG 9-374	Texas A&M University	5667	Dexterous manipulations using magnetic end effector	NAGW 1836	Texas A&M University	5675	Statistical research for precipitation from space
<i>Period</i> 10/01/89-10/01/90	<i>Obligations</i> FY89: \$50,492	TOTAL: \$50,492	<i>Prin. Invest.</i> Driels, M. R.	<i>Period</i> 06/01/89-05/31/90	<i>Obligations</i> FY89: \$41,837	TOTAL: \$41,837	<i>Prin. Invest.</i> Stewart, R. H.
	<i>NASA Tech. Officer</i> JSC/Monford, L.	<i>CASE Category</i> 46-Mech Engr			<i>NASA Tech. Officer</i> HQ-EE/Lagerloef, G. S. HQ-EE/Wilson, W. S.	<i>CASE Category</i> 33-Oceanography	
NAG 9-386	Texas A&M University	5668	Techniques for estimating space station aerodynamic characteristics	NAS 8-36293	Texas A&M University	5676	Hybrid methods for nonlinear transient rotordynamic analysis
<i>Period</i> 07/01/89-07/01/90	<i>Obligations</i> FY89: \$45,032	TOTAL: \$45,032	<i>Prin. Invest.</i> Thomas, R. E.	<i>Period</i> 11/17/86-05/31/88	<i>Obligations</i> FY89:	TOTAL: \$69,474	<i>Prin. Invest.</i> Noah, S. T.
	<i>NASA Tech. Officer</i> JSC/Fitzgerald, S.	<i>CASE Category</i> 41-Aero Engr			<i>NASA Tech. Officer</i> MSFC/Fox, T. A. MSFC/Schutzenhofer, L. A.	<i>CASE Category</i> 46-Mech Engr	
NAG 9-395	Texas A&M University	5669	The fracture criteria of beryllium sheet and tube	NAS 8-37465	Texas A&M University	5677	Dynamic analysis of nonlinear rotor housing systems
<i>Period</i> 09/01/89-09/01/90	<i>Obligations</i> FY89: \$73,158	TOTAL: \$73,158	<i>Prin. Invest.</i> Stafford, S.	<i>Period</i> 07/21/88-09/30/89	<i>Obligations</i> FY89:	TOTAL: \$65,420	<i>Prin. Invest.</i> Noah, S. T.
	<i>NASA Tech. Officer</i> JSC/Castner, W. L.	<i>CASE Category</i> 47-Materials Engr			<i>NASA Tech. Officer</i> MSFC/Fox, T. H. MSFC/Jordan, J. D.	<i>CASE Category</i> 42-Astro Engr	
NAGW 852	Texas A&M University	5670	The use of satellite-derived chlorophyll fields in modeling carbon flux on the southeastern U.S. Continental shelf	NAS 8-37821	Texas A&M University	5678	Pump impeller shroud surfaces prediction of rotor dynamic coefficient and prediction and measurement of secondary flow and pressure fields
<i>Period</i> 12/01/85-05/31/89	<i>Obligations</i> FY89:	TOTAL: \$108,765	<i>Prin. Invest.</i> Hofmann, E. E.	<i>Period</i> 04/26/89-04/25/91	<i>Obligations</i> FY89: \$150,000	TOTAL: \$150,000	<i>Prin. Invest.</i> Childs, W.
	<i>NASA Tech. Officer</i> HQ-EE/Yoder, J. A. HQ-EE/Wilson, W. S.	<i>CASE Category</i> 33-Oceanography	<i>Prin. Invest.</i> McClain, C. R.		<i>NASA Tech. Officer</i> MSFC/Cannon, J. MSFC/Gross, L.	<i>CASE Category</i> 41-Aero Engr	<i>Prin. Invest.</i> Baskharone, E.
NAGW 1194	Texas A&M University	5671	Resurfacing and tectonism on the satellites of Uranus	NAS 9-16443	Texas A&M University	5679	Jet exhaust, ice suppression system validation study
<i>Period</i> 09/15/87-10/31/89	<i>Obligations</i> FY89: \$1,200,000	TOTAL: \$2,283,300	<i>Prin. Invest.</i> Patton, A.	<i>Period</i> 08/05/81-01/01/89	<i>Obligations</i> FY89: \$8,320	TOTAL: \$377,394	<i>Prin. Invest.</i> Porteiro, J. R.
	<i>NASA Tech. Officer</i> HQ/Oran, W. HQ/Whitten, R. P.	<i>CASE Category</i> 19-Phys Sci, NEC	<i>Prin. Invest.</i> Nicks, O.		<i>NASA Tech. Officer</i> JSC/Stroughal, G.	<i>CASE Category</i> 49-Engr, NEC	<i>Prin. Invest.</i> Norton, D. J.
NAGW 1304	Texas A&M University	5672	Paleomagnetic constraints on crustal motions	NAS 9-17972	Texas A&M University	5680	Payload vibration isolation in space
<i>Period</i> 02/01/88-01/31/89	<i>Obligations</i> FY89:	TOTAL: \$8,000	<i>Prin. Invest.</i> Hilde, T. W.	<i>Period</i> 06/01/88-12/01/89	<i>Obligations</i> FY89:	TOTAL: \$82,900	<i>Prin. Invest.</i> Gerhold, C.
	<i>NASA Tech. Officer</i> HQ-EE/Flinn, E. A.	<i>CASE Category</i> 32-Geological Sci			<i>NASA Tech. Officer</i> JSC/Rocha, R.	<i>CASE Category</i> 42-Astro Engr	<i>Prin. Invest.</i> Alexandria, R.
NAGW 1590	Texas A&M University	5673	Single crystal growth of high TC superconductors in bica SR CU systems under microgravity environment	NCC 2-260	Texas A&M University	5681	Development of analytical procedures for helicopter rotor tip aerodynamics
<i>Period</i> 02/01/89-01/31/90	<i>Obligations</i> FY89: \$100,649	TOTAL: \$100,649	<i>Prin. Invest.</i> Pandey, R. K.	<i>Period</i> 09/01/83-02/28/89	<i>Obligations</i> FY89:	TOTAL: \$51,900	<i>Prin. Invest.</i> Hall, G. F.
	<i>NASA Tech. Officer</i> HQ-E/Alexander, J. K. HQ-E/Holland, D. A.	<i>CASE Category</i> 47-Materials Engr			<i>NASA Tech. Officer</i> ARC/Shockey, G. A.	<i>CASE Category</i> 41-Aero Engr	

NASA'S UNIVERSITY PROGRAM **TEXAS (Continued)**

NCC 2-601	Texas A&M University		5682
	Distributed ADA for the spaceborne VHSIC multiprocessor systems part II		
	<i>Period</i>	<i>Obligations</i>	
	01/01/89-12/31/89	FY89: \$102,299	TOTAL: \$102,299
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Volz, R. A.	ARC/Lum, H.	22-Computer Science
		ARC/McKellar, D.	
NCC 3-132	Texas A&M University		5683
	Performance degradation of a rotating system in NASA LERC icing research tunnel		
	<i>Period</i>	<i>Obligations</i>	
	02/21/89-10/20/89	FY89: \$275,000	TOTAL: \$275,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Korkan, K. D.	LERC/Miller, T. L.	41-Aero Engr
		LERC/Reinmann, J. J.	
NGT 00-050-114	Texas A&M University		5684
	NASA graduate student researchers program		
	<i>Period</i>	<i>Obligations</i>	
	05/01/87-04/30/90	FY89: \$18,000	TOTAL: \$54,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Carlson, L. A.	HQ-LE/Owens, F. C.	41-Aero Engr
NGT 00-050-215	Texas A&M University		5685
	NASA graduate student researchers program		
	<i>Period</i>	<i>Obligations</i>	
	06/01/87-08/31/90	FY89: \$18,000	TOTAL: \$53,987
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Hossner, L.	HQ-XE/Owens, F. C.	12-Chemistry
NGT 00-050-221	Texas A&M University		5686
	NASA graduate student researchers program		
	<i>Period</i>	<i>Obligations</i>	
	06/01/87-08/31/88	FY89:	TOTAL: \$17,997
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Ostowari, C.	HQ-XE/Owens, F. C.	41-Aero Engr
NGT 00-050-248	Texas A&M University		5687
	NASA graduate student researchers program		
	<i>Period</i>	<i>Obligations</i>	
	09/01/87-08/31/88	FY89:	TOTAL: \$18,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Ferrell, M. Z.	HQ-XE/Owens, F. C.	76-Sociology
NGT 00-050-261	Texas A&M University		5688
	NASA graduate student researchers program		
	<i>Period</i>	<i>Obligations</i>	
	08/01/88-07/31/89	FY89:	TOTAL: \$18,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Schapery, R.	HQ-XE/Owens, F. C.	47-Materials Engr
NGT 00-050-262	Texas A&M University		5689
	NASA graduate student researchers program		
	<i>Period</i>	<i>Obligations</i>	
	09/01/88-08/31/90	FY89:	TOTAL: \$18,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Allen, D. H.	HQ-XE/Owens, F. C.	41-Aero Engr
NGT 00-050-380	Texas A&M University		5690
	NASA graduate student researchers program		
	<i>Period</i>	<i>Obligations</i>	
	09/01/88-08/31/89	FY89:	TOTAL: \$18,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Poston, J.	HQ-XE/Owens, F. C.	13-Physics
NGT 00-050-381	Texas A&M University		5691
	NASA graduate student researchers program		
	<i>Period</i>	<i>Obligations</i>	
	08/01/88-07/31/90	FY89: \$15,500	TOTAL: \$33,500
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Carlson, L.	HQ-XE/Owens, F. C.	41-Aero Engr
NGT 00-050-388	Texas A&M University		5692
	NASA graduate student researchers program		
	<i>Period</i>	<i>Obligations</i>	
	08/01/88-07/31/89	FY89:	TOTAL: \$10,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Peddycord, K. L.	HQ-XE/Owens, F. C.	49-Engr, NEC
NGT 00-050-401	Texas A&M University		5693
	NASA graduate student researchers program		
	<i>Period</i>	<i>Obligations</i>	
	09/01/89-08/31/90	FY89: \$18,000	TOTAL: \$18,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Painter, J. H.	HQ-XE/Owens, F. C.	45-Elec Engr
NGT 00-070-011	Texas A&M University		5694
	Graduate student researchers underrepresented minority focus program		
	<i>Period</i>	<i>Obligations</i>	
	01/01/87-12/31/88	FY89:	TOTAL: \$36,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	White, R. E.	HQ-LE/Owens, F. C.	43-Chem Engr
NGT 00-070-057	Texas A&M University		5695
	Graduate student researchers underrepresented minority focus program		
	<i>Period</i>	<i>Obligations</i>	
	09/01/87-08/31/89	FY89: \$18,000	TOTAL: \$36,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	White, R. E.	HQ-XE/Owens, F. C.	43-Chem Engr
NGT 00-070-082	Texas A&M University		5696
	Graduate student researchers underrepresented minority focus program		
	<i>Period</i>	<i>Obligations</i>	
	06/01/88-08/31/89	FY89:	TOTAL: \$18,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Russell, D.	HQ-XE/Owens, F. C.	45-Elec Engr
NGT 00-070-108	Texas A&M University		5697
	Graduate student researchers underrepresented minority focus program		
	<i>Period</i>	<i>Obligations</i>	
	01/01/89-12/31/89	FY89: \$18,000	TOTAL: \$18,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Lessard, C. S.	HQ-XE/Owens, F. C.	49-Engr, NEC
NGT 00-070-130	Texas A&M University		5698
	NASA graduate student researchers underrepresented minority focus program		
	<i>Period</i>	<i>Obligations</i>	
	07/01/89-06/30/90	FY89: \$18,000	TOTAL: \$18,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Roschke, P. N.	HQ-XE/Owens, F. C.	44-Civil Engr

NASA'S UNIVERSITY PROGRAM
TEXAS (Continued)

NGT 44-001-800 Texas A&M University 5699
 Summer faculty fellowship program in engineering systems design
Period *Obligations*
 01/01/80-03/31/90 FY89: \$291,155 TOTAL: \$1,627,271
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Jones, W. B. HQ-LB/McGee, A. S. 49-Engr, NEC
 HQ-XE/Schwartz, E. T.

NAG 2-403 Texas Tech University 5707
 Turbulence chaos and numerical algorithms
Period *Obligations*
 07/01/86-04/30/90 FY89: \$34,427 TOTAL: \$94,327
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Martin, C. F. ARC/Chapman, G. T. 29-Math/Computer, NEC
 ARC/Tobak, M.

NGT 44-001-804 Texas A&M University 5700
 NASA graduate student researchers program
Period *Obligations*
 07/01/85-06/30/88 FY89: TOTAL: \$54,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Schapery, R. A. HQ-LE/Owens, F. C. 41-Aero Engr

NAG 2-432 University of Houston - Houston 5708
 Bifurcation and symmetry
Period *Obligations*
 03/01/87-02/28/90 FY89: \$42,781 TOTAL: \$128,418
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Golubitsky, M. ARC/Tobak, M. 29-Math/Computer, NEC
 ARC/Chapman, G. T.

NAG 1-691 Texas Christian University 5701
 Solar powered alkali metal vapor lasers
Period *Obligations*
 08/01/86-10/31/88 FY89: TOTAL: \$79,923
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Blount, C. E. LARC/Jalufka, N. W. 13-Physics
 LARC/Conway, E. J.

NAG 2-503 University of Houston - Houston 5709
 Theoretical studies of molecular collision
Period *Obligations*
 06/01/88-06/30/90 FY89: \$57,559 TOTAL: \$111,352
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Kouri, D. J. ARC/Jaffe, R. L. 12-Chemistry

NAG 9-174 Texas Southern University 5702
 Polarographic and mass spectrometric study of certain species
Period *Obligations*
 09/01/86-03/01/90 FY89: \$80,293 TOTAL: \$312,522
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Wilson, R. F. JSC/Henninger, D. L. 51-Biological Sci

NAG 3-510 University of Houston - Houston 5710
 2 phase flow at zero gravity
Period *Obligations*
 01/02/84-11/28/89 FY89: \$91,980 TOTAL: \$442,444
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Dukler, A. E. LERC/McQuillen, J. B. 43-Chem Engr

NAG 9-258 Texas Southern University 5703
 Connection with spectroscopic determination of certain arc jet physical parameters
Period *Obligations*
 10/01/87-10/01/88 FY89: TOTAL: \$10,332
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Murty, V. S. JSC/Goldstein, S. H. 19-Phys Sci, NEC

NAG 3-639 University of Houston - Houston 5711
 Basic investigations of incompressible elliptic jets
Period *Obligations*
 06/15/85-08/05/90 FY89: \$15,000 TOTAL: \$160,095
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Hussain, A. K. LERC/Rice, E. 41-Aero Engr
 Husain, H. S. LERC/Zaman, K. B.

NAG 9-299 Texas Southern University 5704
 The preparation and study of titanium, zirconium, and hafnium complexes
Period *Obligations*
 06/01/88-12/01/89 FY89: TOTAL: \$96,387
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Wilson, B. L. JSC/McKay, D. S. 12-Chemistry

NAG 5-585 University of Houston - Houston 5712
 Wilson cycle studies
Period *Obligations*
 07/15/85-07/15/90 FY89: TOTAL: \$31,153
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Casey, J. F. GSFC/Welker, J. 32-Geological Sci

NAG 9-325 Texas Southern University 5705
 International food patterns for space food
Period *Obligations*
 09/01/88-11/30/89 FY89: \$59,368 TOTAL: \$59,368
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Ahmed, S. M. JSC/Bourland, C. T. 59-Life Sci, NEC
 JSC/Ritz, R. R.

NAG 5-739 University of Houston - Houston 5713
 Data base interfaces on NASA's heterogeneous distributed data base systems
Period *Obligations*
 02/15/86-12/31/88 FY89: TOTAL: \$35,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Huang, S. S. GSFC/Jacobs, B. E. 22-Computer Science
 GSFC/Berbert, J. H.

NGT 00-050-506 Texas Southern University 5706
 NASA graduate student researchers program
Period *Obligations*
 07/01/89-06/31/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Kristiansen, M. HQ-XE/Owens, F. C. 45-Elec Engr

NAG 9-178 University of Houston - Houston 5714
 Analysis of the behavior of solid polymer electrolytes
Period *Obligations*
 10/01/86-05/01/90 FY89: TOTAL: \$46,435
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Pollard, R. JSC/Darcy, E. 43-Chem Engr
 JSC/Kelly, G. E.

**NASA'S UNIVERSITY PROGRAM
TEXAS (Continued)**

NAG 9-180	University of Houston - Houston	5715
Surface measurements of Leo atomic oxygen exposed polymers		
<i>Period</i>	<i>Obligations</i>	
10/01/86-06/01/88	FY89:	TOTAL: \$9,738
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Ignatiev, A.	JSC/Santos-mason, B.	13-Physics
NAG 9-195	University of Houston - Houston	5716
Methods and techniques for processing data in a distributed heterogeneous environment		
<i>Period</i>	<i>Obligations</i>	
02/01/87-07/01/88	FY89:	TOTAL: \$51,914
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Rusinkiewicz, M. E.	JSC/Gilbert, J. R.	22-Computer Science
Czejdo, B.		
Elmasri, R. A.		
NAG 9-197	University of Houston - Houston	5717
A technology development plan to meet thermal control system requirements in advanced manned space missions		
<i>Period</i>	<i>Obligations</i>	
01/15/87-05/01/88	FY89:	TOTAL: \$59,996
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Bannerot, R. B.	JSC/Ferris, E. P.	46-Mech Engr
NAG 9-210	University of Houston - Houston	5718
Design of an intelligent learning machine		
<i>Period</i>	<i>Obligations</i>	
01/15/87-01/15/89	FY89:	TOTAL: \$52,324
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Johnson, G. G.	JSC/Savely, R. T.	29-Math/Computer, NEC
NAG 9-213	University of Houston - Houston	5719
High altitude ozone with a rocket payload		
<i>Period</i>	<i>Obligations</i>	
01/01/87-04/01/90	FY89:	TOTAL: \$119,335
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Sheldon, W. R.	JSC/Robbins, D. E.	31-Atmos Sci
NAG 9-214	University of Houston - Houston	5720
Growth of plant tissue cultures in simulated lunar soil implication for a lunar base CELSS		
<i>Period</i>	<i>Obligations</i>	
02/01/87-08/01/88	FY89:	TOTAL: \$59,381
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Venkateswaran, S.	JSC/Henninger, D. L.	55-Agriculture Sci
NAG 9-216	University of Houston - Houston	5721
Modelling and prediction of freezing melting with possible sublimation		
<i>Period</i>	<i>Obligations</i>	
02/03/87-08/01/88	FY89:	TOTAL: \$33,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Shamsundar, N.	JSC/Curry, D. M.	47-Materials Engr
NAG 9-218	University of Houston - Houston	5722
High performance mass spectrometry in space for the characterization and purification of products of biotechnology		
<i>Period</i>	<i>Obligations</i>	
06/01/87-08/01/89	FY89:	TOTAL: \$118,460
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Middleditch, B. S.	JSC/Schneider, H. J.	12-Chemistry
NAG 9-219	University of Houston - Houston	5723
Conformal antennas for the astronaut backpack communication system		
<i>Period</i>	<i>Obligations</i>	
06/01/87-06/01/88	FY89:	TOTAL: \$59,614
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Long, S. A.	JSC/Eggers, D. S.	49-Engr, NEC
NAG 9-225	University of Houston - Houston	5724
A new form of medical records for the space flight program		
<i>Period</i>	<i>Obligations</i>	
04/01/87-10/01/89	FY89:	TOTAL: \$60,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Brown, J. H.	JSC/Stewart, D.	56-Medical Sciences
NAG 9-274	University of Houston - Houston	5725
Computer generated feedback mechanisms for orbital antenna pointing		
<i>Period</i>	<i>Obligations</i>	
04/01/88-04/01/90	FY89: \$23,890	TOTAL: \$44,890
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Bourgeois, B.	JSC/Suddath, J. H.	22-Computer Science
NAG 9-277	University of Houston - Houston	5726
Applications of high tc superconductor		
<i>Period</i>	<i>Obligations</i>	
04/01/88-08/01/89	FY89:	TOTAL: \$60,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Wolfe, J. C.	JSC/Krishen, K.	45-Elec Engr
NAG 9-284	University of Houston - Houston	5727
Influence of iodine on granulae activated carbon absorption on the formation of iodine by products		
<i>Period</i>	<i>Obligations</i>	
04/01/88-01/01/90	FY89:	TOTAL: \$59,440
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Symons, J. M.	JSC/Sauer, R. L.	44-Civil Engr
NAG 9-328	University of Houston - Houston	5728
Application of soft ionization mass spectrometry to the analysis of toxic trace organics in space station reclaimed waters		
<i>Period</i>	<i>Obligations</i>	
07/01/88-07/01/90	FY89: \$61,806	TOTAL: \$61,806
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Flory, D. A.	JSC/Sauer, R. L.	59-Life Sci, NEC
Freas, R. B.	JSC/Pierson, D. L.	
NAG 9-345	University of Houston - Houston	5729
Space habitability		
<i>Period</i>	<i>Obligations</i>	
04/15/89-04/15/90	FY89: \$59,930	TOTAL: \$59,930
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Bell, L. E.	JSC/Santy, P. A.	59-Life Sci, NEC
NAG 9-352	University of Houston - Houston	5730
Optimization of high TC superconducting materials for application to microwave and millimeter-wave devices		
<i>Period</i>	<i>Obligations</i>	
04/01/89-04/01/90	FY89: \$60,000	TOTAL: \$60,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Wolfe, J. C.	JSC/Lichtenberg, C.	45-Elec Engr
Williams, J. T.		
Long, S. A.		

NASA'S UNIVERSITY PROGRAM **TEXAS (Continued)**

NAG 9-365 University of Houston - Houston 5731
Mineral chemistry of HED meteorites Apollo 14 breccias
Period Obligations
06/01/89-06/01/90 FY89: \$24,650 TOTAL: \$24,650
Prin. Invest. NASA Tech. Officer CASE Category
Reid, A. M. JSC/Browne, I. D. 32-Geological Sci

NAS 9-16593 University of Houston - Houston 5739
Food service habitat for the space operation center
Period Obligations
03/21/82-10/01/89 FY89: TOTAL: \$170,000
Prin. Invest. NASA Tech. Officer CASE Category
Bell, L. JSC/Santy, P. A. 99-Multi-Discip
Pollette, T.

NAG 9-371 University of Houston - Houston 5732
Scene evaluation
Period Obligations
06/01/89-05/31/90 FY89: \$59,162 TOTAL: \$59,162
Prin. Invest. NASA Tech. Officer CASE Category
Johnson, G. G. JSC/Savely, R. T. 21-Mathematics

NAS 9-17315 University of Houston - Houston 5740
Provide analysis and recommendations to the national space transportation systems program for use in management of its transition from R and D to operations
Period Obligations
01/15/85-04/12/90 FY89: \$98,990 TOTAL: \$493,354
Prin. Invest. NASA Tech. Officer CASE Category
Hunsucker, J. L. JSC/Heselmeyer, R. 99-Multi-Discip

NAG 9-380 University of Houston - Houston 5733
State space self tuner for on-line adaptive control
Period Obligations
05/01/89-06/01/90 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. NASA Tech. Officer CASE Category
Shieh, L. S. JSC/Sunkel, J. W. 45-Elec Engr

NAS 9-17442 University of Houston - Houston 5741
Pressure decay boiling experiment
Period Obligations
07/01/85-07/01/89 FY89: TOTAL: \$122,139
Prin. Invest. NASA Tech. Officer CASE Category
Lienhard, J. H. JSC/Kroll, K. 43-Chem Engr

NAG 9-385 University of Houston - Houston 5734
Multistage design of an optimal momentum management and attitude controller
Period Obligations
09/01/89-09/01/90 FY89: \$53,582 TOTAL: \$53,582
Prin. Invest. NASA Tech. Officer CASE Category
Shieh, L. S. JSC/Sunkel, J. W. 45-Elec Engr

NCA 2-317 University of Houston - Houston 5742
Determination of propagation in turbulent shear flow from numerical simulation
Period Obligations
04/15/88-04/14/90 FY89: \$27,355 TOTAL: \$54,259
Prin. Invest. NASA Tech. Officer CASE Category
Hussain, A. K. ARC/Kim, J. 41-Aero Engr

NAG 9-389 University of Houston - Houston 5735
Scoping study for the institute for space systems operations
Period Obligations
08/01/89-12/01/89 FY89: \$20,365 TOTAL: \$20,365
Prin. Invest. NASA Tech. Officer CASE Category
Witte, L. C. JSC/Bland, D. A. 41-Aero Engr

NGR 44-005-002 University of Houston - Houston 5743
Studies in organic cosmochemistry, including consideration of compound formation under primitive Earth conditions and of organic material in selected meteorites
Period Obligations
06/18/62-09/30/89 FY89: \$116,000 TOTAL: \$2,050,005
Prin. Invest. NASA Tech. Officer CASE Category
Oro, J. HQ-EB/Rummel, J. D. 32-Geological Sci
HQ-EB/Averner, M.

NAG 9-398 University of Houston - Houston 5736
Effects of tutoring in an intelligent computer aided training system
Period Obligations
10/02/89-09/13/90 FY89: \$15,000 TOTAL: \$15,000
Prin. Invest. NASA Tech. Officer CASE Category
Johnson, D. S. JSC/Goldstein, S. H. 22-Computer Science

NGT 00-050-069 University of Houston - Houston 5744
NASA graduate student researchers program
Period Obligations
09/01/86-08/31/88 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Allen, R. H. HQ-LE/Owens, F. C. 46-Mech Engr

NACW 439 University of Houston - Houston 5737
Crater formation and obliteration on the Jovian satellites
Period Obligations
03/01/83-11/30/89 FY89: \$9,300 TOTAL: \$147,939
Prin. Invest. NASA Tech. Officer CASE Category
Boyd, A. HQ-EL/Underwood, J. 32-Geological Sci
HQ-EL/Boyce, J. M.

NGT 00-050-097 University of Houston - Houston 5745
NASA graduate student researchers program
Period Obligations
08/01/86-07/31/89 FY89: TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Hussain, A. K. HQ-LE/Owens, F. C. 46-Mech Engr

NACW 977 University of Houston - Houston 5738
Establishment of a center for the commercial development of space
Period Obligations
09/01/86-12/31/89 FY89: \$2,210,000 TOTAL: \$4,678,528
Prin. Invest. NASA Tech. Officer CASE Category
Oran, W. A. HQ-LE/Oran, W. A. 51-Biological Sci
Whitten, R. P.

NGT 00-050-121 University of Houston - Houston 5746
NASA graduate student researchers program
Period Obligations
09/01/87-08/31/88 FY89: TOTAL: \$16,943
Prin. Invest. NASA Tech. Officer CASE Category
Koopmann, G. H. HQ-LE/Owens, F. C. 46-Mech Engr

NASA'S UNIVERSITY PROGRAM
TEXAS (Continued)

NGT 00-050-173 University of Houston - Houston 5747
 NASA graduate student researchers program

Period	Obligations	
06/01/87-05/31/90	FY89: \$18,000	TOTAL: \$54,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Fox, G.	HQ-XE/Owens, F. C.	12-Chemistry

NAG 9-317 University of Houston - Clear Lake 5755
 Center for minority education for the aerospace industry

Period	Obligations	
09/15/88-03/01/89	FY89:	TOTAL: \$13,500
Prin. Invest.	NASA Tech. Officer	CASE Category
Miller, W. C.	JSC/Atkinson, J. D.	19-Phys Sci, NEC
Sawyer, G. M.		

NGT 00-050-276 University of Houston - Houston 5748
 NASA graduate student researchers program

Period	Obligations	
08/01/88-07/31/90	FY89: \$18,000	TOTAL: \$36,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Lacy, C. E.	HQ-XE/Owens, F. C.	21-Mathematics
Dukler, A. E.		

NCC 9-16 University of Houston - Clear Lake 5756
 Research institute for computing and information systems

Period	Obligations	
05/15/86-06/30/90	FY89: \$5,194,343	TOTAL: \$15,219,524
Prin. Invest.	NASA Tech. Officer	CASE Category
Dickerson, E. T.	JSC/MacDonald, R. B.	22-Computer Science
Houston, A. G.	JSC/Garman, J. R.	

NGT 00-050-415 University of Houston - Houston 5749
 NASA graduate student researchers program

Period	Obligations	
09/01/89-08/31/90	FY89: \$18,000	TOTAL: \$18,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Powell, A.	HQ-XE/Owens, F. C.	46-Mech Engr

NAG 5-486 University of Texas - Arlington 5757
 Scattering models and basic experiments in the microwave regime

Period	Obligations	
10/15/84-08/31/89	FY89:	TOTAL: \$284,726
Prin. Invest.	NASA Tech. Officer	CASE Category
Fung, A. K.	GSFC/Oseroff, H.	55-Agriculture Sci
Blanchard		

NGT 00-070-103 University of Houston - Houston 5750
 Graduate student researchers underrepresented minority focus program

Period	Obligations	
10/01/88-09/30/89	FY89: \$18,000	TOTAL: \$18,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Lienhard, J. H.	HQ-XE/Owens, F. C.	46-Mech Engr

NAGW 1800 University of Texas - Arlington 5758
 Microwave remote sensing

Period	Obligations	
07/01/89-12/31/89	FY89: \$50,000	TOTAL: \$50,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Fung, A. K.	HQ-EE/Asrar, G.	19-Phys Sci, NEC
Blanchard, A. J.	HQ-EE/Pieper, T. J.	

NGT 44-005-803 University of Houston - Houston 5751
 Summer faculty fellowship program

Period	Obligations	
01/01/84-03/31/90	FY89:	TOTAL: \$971,690
Prin. Invest.	NASA Tech. Officer	CASE Category
Bannerot, R. B.	HQ-XE/McGee, A. S.	49-Engr, NEC
	HQ-XE/Schwartz, E. T.	

NCA 2-422 University of Texas - Arlington 5759
 Definition of demonstration program for intelligent control of modular robots

Period	Obligations	
07/01/89-06/30/90	FY89: \$40,000	TOTAL: \$40,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Briggs, K. H.	ARC/Mah, R.	42-Astro Engr
Collins, J. H.		

NGT 44-005-808 University of Houston - Houston 5752
 NASA graduate student researchers program

Period	Obligations	
07/01/85-06/30/89	FY89:	TOTAL: \$72,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Hussain, A. F.	HQ-LE/Owens, F. C.	46-Mech Engr

NGT 00-050-500 University of Texas - Arlington 5760
 NASA graduate student researchers program

Period	Obligations	
06/01/89-05/31/90	FY89: \$18,000	TOTAL: \$18,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Fung, A. K.	HQ-XE/Owens, F. C.	45-Elec Engr

NGT 44-005-809 University of Houston - Houston 5753
 NASA graduate student researchers program

Period	Obligations	
07/01/85-06/30/89	FY89:	TOTAL: \$73,989
Prin. Invest.	NASA Tech. Officer	CASE Category
Hussain, A. K.	HQ-LE/Owens, F. C.	46-Mech Engr

NAG 1-941 University of Texas - Austin 5761
 The effect of temporal and spatial free stream nonuniformities on flow diagnostics and simulation

Period	Obligations	
01/01/89-12/31/89	FY89: \$28,711	TOTAL: \$28,711
Prin. Invest.	NASA Tech. Officer	CASE Category
Wilson, D.	LARC/Wieting, A. R.	41-Aero Engr

NSG 7440 University of Houston - Houston 5754
 Evolutionary relationships in the microbial world

Period	Obligations	
06/01/78-03/31/90	FY89: \$63,000	TOTAL: \$662,498
Prin. Invest.	NASA Tech. Officer	CASE Category
Fox, G. E.	HQ-EB/Rummel, J. D.	51-Biological Sci
	HQ-EB/Averner, M.	

NAG 1-944 University of Texas - Austin 5762
 Robust neighboring optimum guidance for the advanced launch system

Period	Obligations	
12/20/88-12/19/90	FY89: \$205,000	TOTAL: \$205,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Spyster, J. L.	LARC/Moerder, D. D.	41-Aero Engr
Hull, D. G.	LARC/Prich, D. B.	

NASA'S UNIVERSITY PROGRAM **TEXAS (Continued)**

NAG 1-945 University of Texas - Austin 5763
 Robust numerical optimization schemes for real-time advanced launch system guidance
Period Obligations
 12/20/88-12/19/89 FY89: \$100,000 TOTAL: \$100,000
Prin. Invest. NASA Tech. Officer CASE Category
 Spgyer, J. L. LARC/Moerder, D. D. 41-Aero Engr
 Hull, D. G. LARC/Prief, D. B.

NAG 1-965 University of Texas - Austin 5764
 Active structural control synthesis and experiment for the minimax and aces ground test articles
Period Obligations
 03/01/89-02/28/90 FY89: \$100,000 TOTAL: \$100,000
Prin. Invest. NASA Tech. Officer CASE Category
 Wie, B. LARC/Taylor, R. S. 42-Astro Engr
 LARC/Juang, J. N.

NAG 1-1005 University of Texas - Austin 5765
 Exploratory experimental study of separation shock wave dynamics in highly swept turbulent interactive flows
Period Obligations
 06/09/89-01/08/90 FY89: \$50,948 TOTAL: \$50,948
Prin. Invest. NASA Tech. Officer CASE Category
 Dolling, D. S. LARC/Zorumski, W. E. 41-Aero Engr

NAG 2-67 University of Texas - Austin 5766
 Density and temperature structure of clouds around low luminosity young stars
Period Obligations
 09/01/80-10/14/89 FY89: \$213,543 TOTAL: \$1,804,744
Prin. Invest. NASA Tech. Officer CASE Category
 Harvey, P. M. ARC/Haughney, L. C. 11-Astronomy

NAG 2-372 University of Texas - Austin 5767
 Far-infrared emission line spectroscopy for the Kuiper Airborne Observatory
Period Obligations
 1/1/85-03/30/89 FY89: TOTAL: \$97,416
Prin. Invest. NASA Tech. Officer CASE Category
 Eizenstein, H. L. ARC/Haughney, L. C. 11-Astronomy

NAG 2-402 University of Texas - Austin 5768
 Experimental study of a vortex subjected to imposed strain
Period Obligations
 09/01/86-03/31/90 FY89: \$40,034 TOTAL: \$119,935
Prin. Invest. NASA Tech. Officer CASE Category
 Pandey, R. L. ARC/Tobak, M. 41-Aero Engr
 ARC/Peake, D. J.

NAG 2-402 University of Texas - Austin 5769
 Complex far IR and submillimeter heterodyne mixers for airborne and space applications
Period Obligations
 05/01/86-07/30/90 FY89: TOTAL: \$66,000
Prin. Invest. NASA Tech. Officer CASE Category
 R. Sh. S. C. ARC/McCreight, C. R. 13-Physics
 Jaffe, D. T. ARC/Goebel, J. H.
 Gentel, R.

NAG 2-419 University of Texas - Austin 5770
 High resolution far infrared studies of pre main sequence stars with molecular outflows
Period Obligations
 10/01/86-09/30/89 FY89: TOTAL: \$48,292
Prin. Invest. NASA Tech. Officer CASE Category
 Jaffee, D. T. ARC/Haughney, L. C. 11-Astronomy

NAG 2-420 University of Texas - Austin 5771
 High resolution far infrared studies of pre main sequence stars with molecular out flows
Period Obligations
 10/01/86-09/30/89 FY89: \$858 TOTAL: \$62,181
Prin. Invest. NASA Tech. Officer CASE Category
 Evans, N. J. ARC/Haughney, L. C. 11-Astronomy

NAG 2-507 University of Texas - Austin 5772
 System monitoring and diagnosis with qualitative models
Period Obligations
 03/01/88-02/28/90 FY89: \$267,011 TOTAL: \$391,632
Prin. Invest. NASA Tech. Officer CASE Category
 Kuipers, B. J. ARC/Glass, B. J. 22-Computer Science

NAG 2-545 University of Texas - Austin 5773
 Astronomy with the astrometric telescope facility
Period Obligations
 08/01/88-07/31/90 FY89: \$19,922 TOTAL: \$19,922
Prin. Invest. NASA Tech. Officer CASE Category
 Jefferys, W. H. ARC/Nishioka, K. 11-Astronomy

NAG 3-864 University of Texas - Austin 5774
 Turbulence modeling for the simulation of transition in wall shear flows
Period Obligations
 01/05/88-01/13/90 FY89: \$59,997 TOTAL: \$119,902
Prin. Invest. NASA Tech. Officer CASE Category
 Crawford, M. E. LERC/Simon, F. F. 49-Engr, NEC

NAG 3-921 University of Texas - Austin 5775
 Experimental investigation of surface tension driven convection as a feasibility study for a microgravity experiment
Period Obligations
 07/15/88-10/15/89 FY89: TOTAL: \$49,494
Prin. Invest. NASA Tech. Officer CASE Category
 Koschmieder, E. L. LERC/Salzman, J. A. 44-Civil Engr

NAG 3-928 University of Texas - Austin 5776
 Application of superconducting electromagnet launch technology and constant thrust CIS lunar spacecraft
Period Obligations
 09/01/88-09/01/90 FY89: TOTAL: \$80,000
Prin. Invest. NASA Tech. Officer CASE Category
 Nozette, S. LERC/Schultz, D. 49-Engr, NEC
 Kolm, H.

NAG 3-1023 University of Texas - Austin 5777
 Joint univ NASA experimental and computational study of unsteady shock wave
Period Obligations
 03/13/89-03/12/90 FY89: \$40,009 TOTAL: \$40,009
Prin. Invest. NASA Tech. Officer CASE Category
 Dolling, D. S. LERC/Hingst, W. R. 41-Aero Engr
 LERC/Porro, A. R.

NAG 5-528 University of Texas - Austin 5778
 Simulation and analysis of a geopotential mission
Period Obligations
 04/15/85-12/31/88 FY89: TOTAL: \$260,000
Prin. Invest. NASA Tech. Officer CASE Category
 Schutz, B. GSFC/Welker, J. E. 32-Geological Sci
 Tapley, B. D.

**NASA'S UNIVERSITY PROGRAM
TEXAS (Continued)**

NAG 5-746	University of Texas - Austin	5779	Altimeter measurements for determination of the Earth's gravity field
<i>Period</i>	<i>Obligations</i>		
03/15/86-10/31/89	FY89:	TOTAL: \$120,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Tapley, B. D.	GSFC/Christodoulidis, D. C.	13-Physics	
Schutz, B. E.	GSFC/Marsh, J. G.		
Shum, C. K.			
NAG 5-754	University of Texas - Austin	5780	Earth rotation parameters from an on-site study of laser ranging data
<i>Period</i>	<i>Obligations</i>		
03/15/86-04/30/90	FY89: \$36,728	TOTAL: \$155,169	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Shelus, P. J.	GSFC/Frey, H. V.	32-Geological Sci	
Ricklefs, R. L.			
NAG 5-756	University of Texas - Austin	5781	Studies of water storage and other contributions to changes in the rotation of the Earth
<i>Period</i>	<i>Obligations</i>		
03/15/86-06/30/90	FY89: \$63,359	TOTAL: \$249,104	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Wilson, C. R.	GSFC/Frey, H. V.	32-Geological Sci	
NAG 5-757	University of Texas - Austin	5782	Geophysical parameters from the analysis of laser ranging and starlette
<i>Period</i>	<i>Obligations</i>		
03/15/86-07/31/90	FY89: \$56,000	TOTAL: \$235,666	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Schutz, B. E.	GSFC/Frey, H. V.	32-Geological Sci	
Shum, C. K.			
NAG 5-787	University of Texas - Austin	5783	Undersea volcano production versus lithospheric strength
<i>Period</i>	<i>Obligations</i>		
06/01/86-09/30/89	FY89: \$33,000	TOTAL: \$171,612	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Sandwell, D. T.	GSFC/Welker, J. E.	32-Geological Sci	
NAG 5-940	University of Texas - Austin	5784	Precision ephemeris determination for the department of defense Global Positioning System
<i>Period</i>	<i>Obligations</i>		
07/01/87-11/30/89	FY89: \$165,000	TOTAL: \$400,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Tapley, B. D.	GSFC/Kolenkiewicz, R.	32-Geological Sci	
NAG 5-978	University of Texas - Austin	5785	Ultraviolet observations of the possible halo of a selected planetary nebula
<i>Period</i>	<i>Obligations</i>		
09/01/87-08/31/90	FY89:	TOTAL: \$33,600	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Danly, L.	GSFC/Kondo, Y.	11-Astronomy	
Garnett, D. R.			
NAG 5-987	University of Texas - Austin	5786	Analysis of coordinated observations of a giant stellar flare
<i>Period</i>	<i>Obligations</i>		
09/01/87-08/31/89	FY89:	TOTAL: \$2,520	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Lambert, D. L.	GSFC/Kondo, Y.	11-Astronomy	
Hawley, S. L.			
NAG 5-994	University of Texas - Austin	5787	Ultraviolet/optical observations binary white dwarf stars
<i>Period</i>	<i>Obligations</i>		
09/01/87-08/31/88	FY89:	TOTAL: \$14,689	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Winget, D. E.	GSFC/Kondo, Y.	11-Astronomy	
Warner, B.			
NAG 5-1021	University of Texas - Austin	5788	Lageas satellite laser ranging data analysis
<i>Period</i>	<i>Obligations</i>		
11/01/87-11/30/89	FY89: \$100,000	TOTAL: \$192,612	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Tapley, B. D.	GSFC/Kolenkiewicz, R.	32-Geological Sci	
NAG 5-1041	University of Texas - Austin	5789	A seismotectonic and seismic slip characterization of the oceanic transition in the region of the Gulf of California
<i>Period</i>	<i>Obligations</i>		
03/15/88-05/31/90	FY89: \$67,788	TOTAL: \$117,936	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Sclater, J. G.	GSFC/Welker, J. E.	32-Geological Sci	
NAG 5-1092	University of Texas - Austin	5790	Magnetohydrodynamic shocks in coronal mass ejections
<i>Period</i>	<i>Obligations</i>		
10/15/88-10/14/89	FY89: \$32,454	TOTAL: \$32,454	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Steinolfson, R. S.	GSFC/Bullock, G. D.	19-Phys Sci, NEC	
	GSFC/Gurman, J. B.		
NAG 5-1108	University of Texas - Austin	5791	Selected quasi-stellar object-unique or typical
<i>Period</i>	<i>Obligations</i>		
11/01/88-10/31/90	FY89: \$24,001	TOTAL: \$24,001	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Wills, B.	GSFC/West, D.	11-Astronomy	
NAG 5-1118	University of Texas - Austin	5792	The determination of crustal motions using satellite laser ranging
<i>Period</i>	<i>Obligations</i>		
02/15/89-02/14/90	FY89: \$139,848	TOTAL: \$139,848	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Tapley, B. D.	GSFC/Frey, H.	39-Env Sci, NEC	
Schutz, B. E.			
NAG 5-1263	University of Texas - Austin	5793	Analysis of interstellar cloud structure based on infrared astronomical satellite IRAS images
<i>Period</i>	<i>Obligations</i>		
09/15/89-12/14/89	FY89: \$8,900	TOTAL: \$8,900	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Scalo, J.	GSFC/West, D.	11-Astronomy	
NAG 9-114	University of Texas - Austin	5794	Hypervelocity penetration study of composite materials
<i>Period</i>	<i>Obligations</i>		
06/01/85-10/01/89	FY89: \$50,000	TOTAL: \$158,114	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Yew, C. H.	JSC/Christiansen, E. L.	47-Materials Engr	
Kyriakides, S.			

**NASA'S UNIVERSITY PROGRAM
TEXAS (Continued)**

NAG 9-188	University of Texas - Austin	5795	The development of technology for improving productivity
<i>Period</i>	<i>Obligations</i>		
12/01/86-12/01/88	FY89:	TOTAL: \$184,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Tesar, D.	JSC/Gist, A. D.	41-Aero Engr	
NAG 9-200	University of Texas - Austin	5796	A qualitative approach to robot exploration and mapping
<i>Period</i>	<i>Obligations</i>		
01/01/87-10/01/89	FY89:	TOTAL: \$119,896	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Kuipers, B.	JSC/Erickson, J. D.	49-Engr, NEC	
NAG 9-201	University of Texas - Austin	5797	Energy transfer in the ignition mechanism of a NASA standard initiator
<i>Period</i>	<i>Obligations</i>		
02/01/87-08/01/88	FY89:	TOTAL: \$28,294	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Varghese, P. L.	JSC/Tassel, K. V.	46-Mech Engr	
NAG 9-205	University of Texas - Austin	5798	Thermal fatigue in metal matrix composites
<i>Period</i>	<i>Obligations</i>		
01/01/87-04/01/89	FY89:	TOTAL: \$157,897	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Marcus, H. L.	JSC/Horiuchi, G. K.	47-Materials Engr	
Rabenberg, L. K.			
NAG 9-278	University of Texas - Austin	5799	Designing and evaluating automation and robotics technologies for space systems
<i>Period</i>	<i>Obligations</i>		
04/01/88-09/01/89	FY89:	TOTAL: \$48,913	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Bard, J. F.	JSC/Heydorn, R. P.	46-Mech Engr	
NAG 9-279	University of Texas - Austin	5800	Control structures interaction research
<i>Period</i>	<i>Obligations</i>		
04/01/88-06/01/89	FY89:	TOTAL: \$50,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Wie, B.	JSC/Sunkel, J. W.	41-Aero Engr	
NAG 9-287	University of Texas - Austin	5801	Applications of synthetic neural network to Fault detection and diagnosis
<i>Period</i>	<i>Obligations</i>		
04/01/88-04/01/89	FY89:	TOTAL: \$47,683	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Himmelblau, D. M.	JSC/Savely, R. T.	56-Medical Sciences	
NAG 9-288	University of Texas - Austin	5802	New adaptive control structures with application to the control of a space platform
<i>Period</i>	<i>Obligations</i>		
04/01/88-06/01/89	FY89:	TOTAL: \$46,355	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Speyer, J. L.	JSC/Bishop, L. R.	41-Aero Engr	
NAG 9-301	University of Texas - Austin	5803	Heat transfer in zirconium potassium perchlorate at low temperatures
<i>Period</i>	<i>Obligations</i>		
08/01/88-01/01/90	FY89:	TOTAL: \$12,500	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Varghese, P. L.	JSC/Van Tassel, K. E.	46-Mech Engr	
NAG 9-320	University of Texas - Austin	5804	Architectural study of the design and operation of advanced force feedback manual controllers
<i>Period</i>	<i>Obligations</i>		
11/01/88-11/01/89	FY89: \$75,000	TOTAL: \$75,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Tesar, D.	JSC/Price, C. R.	47-Materials Engr	
NAG 9-346	University of Texas - Austin	5805	Test analysis procedures for updating math models of Space Shuttle payloads
<i>Period</i>	<i>Obligations</i>		
05/01/89-05/01/90	FY89: \$57,191	TOTAL: \$57,191	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Craig, R. R.	JSC/Hamilton, D. A.	46-Mech Engr	
NAG 9-351	University of Texas - Austin	5806	Redundancy management for efficient Fault recovery in NASA's distributed computing system
<i>Period</i>	<i>Obligations</i>		
04/01/89-04/01/90	FY89: \$60,000	TOTAL: \$60,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Malek, M.	JSC/Abbott, L.	22-Computer Science	
NAG 9-357	University of Texas - Austin	5807	Application of Lanczos vectors to control design of flexible structures
<i>Period</i>	<i>Obligations</i>		
06/01/89-06/01/90	FY89: \$70,000	TOTAL: \$70,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Craig, R. R.	JSC/Sunkel, J. W.	41-Aero Engr	
NAG 9-360	University of Texas - Austin	5808	Precision automation technology for assembly tasks
<i>Period</i>	<i>Obligations</i>		
06/01/89-06/01/90	FY89: \$75,000	TOTAL: \$75,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Tesar, D. E.	JSC/Adams, J. C.	46-Mech Engr	
Freeman, R. A.	JSC/Erickson, J. D.		
NAG 9-361	University of Texas - Austin	5809	Computer vision based site selection and hazard detection for Mars planetary Lander
<i>Period</i>	<i>Obligations</i>		
04/01/89-04/01/90	FY89: \$52,457	TOTAL: \$52,457	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Nandhakumar, N.	JSC/Baker, K.	22-Computer Science	
Aggarwal, J. K.			
NAG 9-397	University of Texas - Austin	5810	Research of biosynthesis of cellulose under microgravity conditions
<i>Period</i>	<i>Obligations</i>		
09/01/89-09/01/90	FY89: \$20,000	TOTAL: \$20,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Brown, R. M.	JSC/Gonda, S. R.	51-Biological Sci	
	JSC/Sams, C. F.		

NASA'S UNIVERSITY PROGRAM
TEXAS (Continued)

NAGW 846 University of Texas - Austin 5811
 Magnetic energy storage and conversion in the solar atmosphere
Period Obligations
 12/01/85-11/30/88 FY89: TOTAL: \$290,275
Prin. Invest. NASA Tech. Officer CASE Category
 Tajima, T. HQ-E/Rosendhal, J. D. 13-Physics
 HQ-E/Konkel, R. M.

NAGW 964 University of Texas - Austin 5812
 A center of excellence for hypersonic training and research
Period Obligations
 08/01/86-07/31/90 FY89: \$399,397 TOTAL: \$797,775
Prin. Invest. NASA Tech. Officer CASE Category
 Dolling, D. S. HQ-RF/Wander, S. M. 13-Physics
 Amirkabitan, I. HQ-RF/Graves, R. A.
 Crawford, M.

NAGW 1064 University of Texas - Austin 5813
 Meteoroid environment near the Earth Moon system
Period Obligations
 05/01/87-05/31/90 FY89: \$1,736 TOTAL: \$62,421
Prin. Invest. NASA Tech. Officer CASE Category
 Nakamura, Y. HQ-EL/Underwood, J. R. 32-Geological Sci
 HQ-EL/Boyce, J. M.

NAGW 1324 University of Texas - Austin 5814
 Coronal dynamics
Period Obligations
 06/01/88-05/31/90 FY89: \$55,000 TOTAL: \$99,157
Prin. Invest. NASA Tech. Officer CASE Category
 Steinolfson, R. S. HQ-ES/Bohlin, J. D. 13-Physics
 HQ-ES/Kane, S.

NAGW 1330 University of Texas - Austin 5815
 Measuring the lense thirring precession using a second lagees satellite
Period Obligations
 04/01/88-09/30/89 FY89: \$167,000 TOTAL: \$257,000
Prin. Invest. NASA Tech. Officer CASE Category
 Tapley, B. D. HQ-EZ/Stachnik, R. V. 11-Astronomy

NAGW 1477 University of Texas - Austin 5816
 A continued program of planetary study at the University of Texas
 McDonald Observatory
Period Obligations
 01/01/89-12/31/90 FY89: \$1,091,583 TOTAL: \$1,091,583
Prin. Invest. NASA Tech. Officer CASE Category
 Smith, H. J. HQ-EL/Rahe, J. H. 11-Astronomy

NAGW 1519 University of Texas - Austin 5817
 Cellular bases of gravity and light induced geotropism
Period Obligations
 11/01/88-10/31/89 FY89: \$60,000 TOTAL: \$60,000
Prin. Invest. NASA Tech. Officer CASE Category
 Roux, S. J. HQ-EB/Halstead, T. W. 51-Biological Sci

NAGW 1537 University of Texas - Austin 5818
 Astrometric support for the reduction of Hipparcos coordinate system
 data
Period Obligations
 01/01/89-12/31/89 FY89: \$36,928 TOTAL: \$36,928
Prin. Invest. NASA Tech. Officer CASE Category
 Hemenway, P. D. HQ-EZ/Clayton, G. C. 11-Astronomy

NAS 1-17802 University of Texas - Austin 5819
 Performance of technical support in propagation of noise from large
 wind turbine generators
Period Obligations
 07/20/84-10/30/87 FY89: TOTAL: \$143,952
Prin. Invest. NASA Tech. Officer CASE Category
 Blackstock, D. T. LARC/Preisser, J. S. 13-Physics
 LARC/Deloach, R.

NAS 5-29285 University of Texas - Austin 5820
 Space telescope guaranteed observation program
Period Obligations
 12/20/85-05/31/90 FY89: \$114,000 TOTAL: \$288,000
Prin. Invest. NASA Tech. Officer CASE Category
 Jefferys, W. H. GSFC/Kalinowski, K. 41-Aero Engr

NAS 5-29395 University of Texas - Austin 5821
 Guaranteed time observations of the high resolution spectrograph of
 the Hubble space telescope
Period Obligations
 02/24/87-10/30/91 FY89: \$20,000 TOTAL: \$78,000
Prin. Invest. NASA Tech. Officer CASE Category
 Trafton, L. GSFC/Vitagliano, H. D. 11-Astronomy

NAS 5-29404 University of Texas - Austin 5822
 Laser tracking support
Period Obligations
 01/01/86-03/31/90 FY89: \$680,910 TOTAL: \$2,463,783
Prin. Invest. NASA Tech. Officer CASE Category
 Shelvs, P. J. GSFC/Appler, R. 49-Engr, NEC
 GSFC/Portas, S.

NAS 5-29410 University of Texas - Austin 5823
 Guaranteed time observation program
Period Obligations
 02/04/86-05/31/90 FY89: \$15,000 TOTAL: \$75,000
Prin. Invest. NASA Tech. Officer CASE Category
 Lambert, D. GSFC/Kalinowski, J. K. 41-Aero Engr

NAS 8-32905 University of Texas - Austin 5824
 Scientific investigation in support of the space telescope project
Period Obligations
 02/15/78-04/30/90 FY89: TOTAL: \$390,524
Prin. Invest. NASA Tech. Officer CASE Category
 Lambert, D. L. MSFC/Taylor, W. E. 11-Astronomy

NAS 8-32906 University of Texas - Austin 5825
 Scientific investigations in support of the space telescope project, to
 assure that the space telescope will perform astrometric functions
Period Obligations
 02/01/78-09/30/89 FY89: \$987,062 TOTAL: \$5,412,095
Prin. Invest. NASA Tech. Officer CASE Category
 Jefferys, W. H. MSFC/Harrington, M. M. 11-Astronomy

NAS 8-36224 University of Texas - Austin 5826
 A computer aided approach to nonlinear control synthesis
Period Obligations
 06/24/87-06/23/89 FY89: TOTAL: \$115,990
Prin. Invest. NASA Tech. Officer CASE Category
 Wie, B. MSFC/Carroll, S. N. 22-Computer Science
 MSFC/Crook, G. S.

NASA'S UNIVERSITY PROGRAM **TEXAS (Continued)**

NAS 9-17254 University of Texas - Austin 5827
Study of attachment modes in the control of large space structures
Period Obligations
10/01/84-09/01/89 FY89: TOTAL: \$119,193
Prin. Invest. NASA Tech. Officer CASE Category
Craig, R. JSC/Rocha, R. 42-Astro Engr
Bennighof, J. K. JSC/Dagen, J.

NCA 2-179 University of Texas - Austin 5828
Application of 3 D complex variables to potential flows
Period Obligations
11/01/86-09/30/89 FY89: TOTAL: \$60,103
Prin. Invest. NASA Tech. Officer CASE Category
Panton, R. L. ARC/Martin, E. D. 46-Mech Engr

NCA 2-207 University of Texas - Austin 5829
Instabilities and the transition to turbulent flow in channels with cylindrical eddy promoters
Period Obligations
06/01/87-05/31/90 FY89: \$10,000 TOTAL: \$65,000
Prin. Invest. NASA Tech. Officer CASE Category
Swinney, H. L. ARC/Kim, J. 13-Physics

NCC 2-286 University of Texas - Austin 5830
Crew selection training and performance
Period Obligations
02/01/84-11/30/89 FY89: \$255,000 TOTAL: \$925,726
Prin. Invest. NASA Tech. Officer CASE Category
Helmreich, R. L. ARC/Foushee, H. C. 62-Social Aspects
ARC/Kanki, B. G.

NCC 2-629 University of Texas - Austin 5831
Utility and incomplete-theories: Addressing two important problems in explanation-based learning
Period Obligations
06/01/89-10/31/89 FY89: \$25,000 TOTAL: \$25,000
Prin. Invest. NASA Tech. Officer CASE Category
Mooney, R. ARC/Zweben, M. 22-Computer Science

NCC 3-127 University of Texas - Austin 5832
Near field interaction of microwave
Period Obligations
02/20/89-02/19/90 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. NASA Tech. Officer CASE Category
Ling, H. LERC/Zaman, A. J. 45-Elec Engr
Hallock, G. A.

NGR 44-012-152 University of Texas - Austin 5833
A program of planetary studies
Period Obligations
06/25/69-06/30/89 FY89: TOTAL: \$8,118,839
Prin. Invest. NASA Tech. Officer CASE Category
Smith, H. J. HQ-EL/Brinton, H. C. 11-Astronomy
HQ-EL/Rahe, J. H.

NGT 00-050-062 University of Texas - Austin 5834
NASA graduate student researchers program
Period Obligations
09/01/86-08/31/89 FY89: \$15,000 TOTAL: \$51,000
Prin. Invest. NASA Tech. Officer CASE Category
Fowler, W. T. HQ-LE/Owens, F. C. 41-Aero Engr

NGT 00-050-155 University of Texas - Austin 5835
NASA graduate student researchers program
Period Obligations
09/01/87-08/31/90 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Tapley, B. D. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 00-050-172 University of Texas - Austin 5836
NASA graduate student researchers program
Period Obligations
09/01/87-08/31/90 FY89: \$36,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Dolling, D. S. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 00-050-180 University of Texas - Austin 5837
NASA graduate student researchers program
Period Obligations
06/01/87-09/30/89 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Smoluchowski, R. HQ-XE/Owens, F. C. 11-Astronomy

NGT 00-050-210 University of Texas - Austin 5838
NASA graduate student researchers program
Period Obligations
06/01/87-05/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Winget, D. E. HQ-XE/Owens, F. C. 31-Atmos Sci

NGT 00-050-222 University of Texas - Austin 5839
NASA graduate student researchers program
Period Obligations
09/01/87-08/31/90 FY89: \$36,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Fowler, W. T. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 00-050-223 University of Texas - Austin 5840
NASA graduate student researchers program
Period Obligations
06/01/87-05/31/88 FY89: TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Koen, B. V. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 00-050-249 University of Texas - Austin 5841
NASA graduate student researchers program
Period Obligations
09/01/87-08/31/89 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Lambert, D. L. HQ-XE/Owens, F. C. 11-Astronomy

NGT 00-050-311 University of Texas - Austin 5842
NASA graduate student researchers program
Period Obligations
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Cochran, W. D. HQ-XE/Owens, F. C. 11-Astronomy

NGT 00-050-316 University of Texas - Austin 5843
NASA graduate student researchers program
Period Obligations
09/01/88-08/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Shapiro, P. R. HQ-XE/Owens, F. C. 11-Astronomy

**NASA'S UNIVERSITY PROGRAM
TEXAS (Continued)**

NGT 00-050-320 University of Texas - Austin 5844
NASA graduate student researchers program
Period Obligations
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Evans, N. J. HQ-XE/Owens, F. C. 19-Phys Sci, NEC

NGT 00-050-422 University of Texas - Austin 5845
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Schutz, B. E. HQ-XE/Owens, F. C. 22-Computer Science

NGT 00-050-468 University of Texas - Austin 5846
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Winget, D. E. HQ-XE/Owens, F. C. 11-Astronomy

NGT 00-050-473 University of Texas - Austin 5847
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
O'Connor, J. T. HQ-XE/Schwartz, E. 44-Civil Engr

NGT 00-050-476 University of Texas - Austin 5848
NASA graduate student researchers program
Period Obligations
08/01/89-07/31/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Jaffe, D. HQ-XE/Owens, F. C. 11-Astronomy

NGT 00-050-519 University of Texas - Austin 5849
NASA graduate student researchers program
Period Obligations
09/01/89-08/31/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Shapiro, P. R. HQ-XE/Owens, F. C. 13-Physics

NGT 00-070-023 University of Texas - Austin 5850
Graduate student researchers underrepresented minority focus program
Period Obligations
06/01/87-05/31/89 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Nozette, S. HQ-LE/Owens, F. C. 41-Aero Engr

NGT 00-070-029 University of Texas - Austin 5851
Graduate student researchers underrepresented minority focus program
Period Obligations
09/01/87-08/31/90 FY89: \$36,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Wilson, C. R. HQ-XE/Owens, F. C. 32-Geological Sci

NGT 00-070-032 University of Texas - Austin 5852
Graduate student researchers underrepresented minority focus program
Period Obligations
08/01/87-07/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Dolling, D. S. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 00-070-111 University of Texas - Austin 5853
NASA graduate student researchers underrepresented minority focus program
Period Obligations
01/16/89-01/15/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Berlin, J. J. HQ-XE/Owens, F. C. 49-Engr, NEC

NGT 00-070-145 University of Texas - Austin 5854
NASA graduate student researchers underrepresented minority focus program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Dolling, D. S. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 44-012-803 University of Texas - Austin 5855
NASA graduate student researchers program
Period Obligations
06/01/84-08/31/88 FY89: TOTAL: \$49,000
Prin. Invest. NASA Tech. Officer CASE Category
Hull, D. G. HQ-LB/Owens, F. C. 49-Engr, NEC
Speyer, J. L.

NSG 7232 University of Texas - Austin 5856
Astrophysics of supermassive accretion disks
Period Obligations
05/01/76-06/30/89 FY89: TOTAL: \$328,171
Prin. Invest. NASA Tech. Officer CASE Category
Shields, G. HQ-EZ/Stachnik, R. V. 39-Env Sci, NEC
Wheeler, J. C. HQ-EZ/Bogges, N. W.

NSG 7480 University of Texas - Austin 5857
The cellular bases of gravity- and light-induced geotropism
Period Obligations
08/15/78-01/31/89 FY89: TOTAL: \$502,000
Prin. Invest. NASA Tech. Officer CASE Category
Roux, S. J. HQ-EB/Halstead, T. W. 51-Biological Sci

NSG 7505 University of Texas - Austin 5858
Solid state problems in the solar systems
Period Obligations
09/01/78-10/31/89 FY89: \$11,900 TOTAL: \$501,613
Prin. Invest. NASA Tech. Officer CASE Category
Smoluchowski, R. HQ-EL/Underwood, J. R. 32-Geological Sci
HQ-EL/Boyce, J. M.

NAG 1-989 University of Texas - Dallas 5859
The study of pressure measurement techniques and devices in the range of 10-1 to 10-4 torr for the aeroassist flight experiment
Period Obligations
03/10/89-12/09/89 FY89: \$150,000 TOTAL: \$150,000
Prin. Invest. NASA Tech. Officer CASE Category
Hoffman, J. H. LARC/Siemers, P. M. 13-Physics
Hodges, R. R. LARC/Kern, F. A.

NAG 5-305 University of Texas - Dallas 5860
Retarding potential analyzer research
Period Obligations
04/01/83-12/31/89 FY89: \$75,000 TOTAL: \$1,096,297
Prin. Invest. NASA Tech. Officer CASE Category
Hanson, W. GSFC/Bullock, G. D. 19-Phys Sci, NEC
GSFC/Hoffman, R. A.

NASA'S UNIVERSITY PROGRAM
TEXAS (Continued)

NAG 5-306 University of Texas - Dallas 5861
 Ion drift meter research
Period *Obligations*
 04/01/83-12/31/89 FY89: \$129,807 TOTAL: \$1,181,177
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Heelis, R. A. GSFC/Bullock, G. D. 19-Phys Sci, NEC
 GSFC/Hoffman, R. A.

NAG 8-80 University of Texas - Dallas 5862
 The application of 360 rotating ion mirror as an input device to a retarding ion mass spectrometer for low energy measurements in the terrestrial atmosphere
Period *Obligations*
 12/04/86-10/31/88 FY89: TOTAL: \$128,370
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Hoffman, J. H. MSFC/Waite, J. H. 13-Physics
 Hanson, W. B. MSFC/Fields, S. A.

NAG 8-688 University of Texas - Dallas 5863
 Design studies of the thermal ion dynamics experiment for the ISTP
Period *Obligations*
 10/01/87-09/30/88 FY89: TOTAL: \$75,008
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Hoffman, J. H. MSFC/Chappell, C. R. 13-Physics
 MSFC/Fields, S. A.

NAGW 632 University of Texas - Dallas 5864
 Atomic data of planetary and cometary interest
Period *Obligations*
 04/01/84-03/31/88 FY89: TOTAL: \$85,321
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Cunningham, A. J. HQ-EL/Fox, K. 31-Atmos Sci
 HQ-EL/Quaide, W. L.

NAGW 935 University of Texas - Dallas 5865
 Impulsive penetration and viscous interaction
Period *Obligations*
 09/01/86-08/31/89 FY89: TOTAL: \$60,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Heikkila, W. J. HQ-ES/Mellott, M. M. 13-Physics
 HQ-ES/Perry, T. W.

NAGW 957 University of Texas - Dallas 5866
 To find the normal component of the magnetic field across the neutral sheet in the distant magnetotail detected by ISEE 3
Period *Obligations*
 09/01/86-08/31/89 FY89: \$25,000 TOTAL: \$70,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Heikkila, W. J. HQ-ES/Mellott, M. M. 13-Physics
 HQ-EE/Eastman, T. E.

NAGW 1161 University of Texas - Dallas 5867
 Evaluation of the hamisara shear zone ne suclar an integrated program of remote sensing field studies and geochronology
Period *Obligations*
 08/01/87-08/31/89 FY89: TOTAL: \$110,590
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Stern, R. J. HQ-EE/Baltuck, M. 32-Geological Sci
 HQ-EE/Murphy, R. E.

NAGW 1267 University of Texas - Dallas 5868
 Giotto data analysis neutral mass spectrometer data from Halley's comet
Period *Obligations*
 02/01/88-01/31/90 FY89: \$71,900 TOTAL: \$235,676
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Hoffman, J. T. HQ-EL/Bergstrahl, J. T. 11-Astronomy
 HQ-EZ/Bunner, A. N.

NAGW 1571 University of Texas - Dallas 5869
 Atomic hydrogen and nitrogen distribution from atmosphere Explorer
Period *Obligations*
 11/01/88-10/31/89 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Breig, E. L. HQ-ES/Mellott, M. M. 13-Physics
 HQ-ES/Perry, T. W.

NAGW 1665 University of Texas - Dallas 5870
 Interdisciplinary study of planetary atmospheres
Period *Obligations*
 04/01/89-10/31/89 FY89: \$46,667 TOTAL: \$46,667
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Johnson, F. S. HQ-EL/Bergstrahl, J. T. 31-Atmos Sci

NAS 1-17399 University of Texas - Dallas 5871
 Support activities to maintain shuttle upper atmosphere mass spectrometer (SUMS) flight readiness
Period *Obligations*
 07/15/83-08/31/90 FY89: \$100,000 TOTAL: \$562,216
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Hoffman, J. H. LARC/Blanchard, R. C. 19-Phys Sci, NEC
 LARC/Duckett, R. J.

NAS 1-18793 University of Texas - Dallas 5872
 Plasma ion and electron concentration experiment piece
Period *Obligations*
 01/13/89-01/13/94 FY89: \$226,000 TOTAL: \$226,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Hanson, W. B. LARC/Duckett, R. J. 41-Aero Engr
 LARC/Hartung, L. C.

NAS 5-25310 University of Texas - Dallas 5873
 Design, development, fabrication, test and calibration of the ion velocity instrument for the San Marco spacecraft
Period *Obligations*
 09/18/78-11/30/89 FY89: \$136,000 TOTAL: \$714,897
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Hanson, W. B. GSFC/Adkins, R. E. 13-Physics

NAS 5-30685 University of Texas - Dallas 5874
 The ionospheric plasma and electrodynamics instrument IPEI for the Earth observing system EOS
Period *Obligations*
 07/25/89-12/31/91 FY89: \$100,000 TOTAL: \$100,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Heelis, R. A. GSFC/Duntzler, A. 31-Atmos Sci

NAS 8-33827 University of Texas - Dallas 5875
 Measurement of visible and UV emissions from energetic neutral atom precipitation definition phase study
Period *Obligations*
 08/12/80-04/15/92 FY89: \$19,000 TOTAL: \$330,875
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Tinsley, B. A. MSFC/Jones, C. T. 31-Atmos Sci
 Rohrbaugh, D. P. MSFC/Ise, R.

**NASA'S UNIVERSITY PROGRAM
TEXAS (Continued)**

NAS 8-36954 University of Texas - Dallas 5876
Cometary retarding ion mass spectrometer development
Period *Obligations*
07/28/87-12/31/89 FY89: \$78,372 TOTAL: \$348,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Heelis, R. A. MSFC/Moore, T. E. 11-Astronomy
Hanson, W. B. MSFC/Feilds, S. A.

NAS 8-37582 University of Texas - Dallas 5877
A miniature mass analyzer and associated instrumentation for improved capabilities in the analysis of low energy plasmas from a rocket or satellite platform
Period *Obligations*
12/09/88-12/09/91 FY89: \$86,208 TOTAL: \$86,208
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hoffman, J. H. MSFC/Moore, T. E. 13-Physics
MSFC/Fields, S. A.

NCC 1-119 University of Texas - Dallas 5878
Aerocassist flight experiment ion mass spectrometer feasibility study
Period *Obligations*
06/01/87-05/31/89 FY89: TOTAL: \$175,405
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hoffman, J. H. LARC/Gustafson, J. C. 13-Physics
LARC/Hartung, L. C.

NGL 44-004-026 University of Texas - Dallas 5879
Investigations into the mechanism and rates of atmospheric mixing in the lower thermosphere
Period *Obligations*
05/05/85-03/31/89 FY89: TOTAL: \$3,365,054
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Johnson, F. S. HQ-EL/Fox, K. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NGR 44-004-120 University of Texas - Dallas 5880
Space plasma physics data analysis program
Period *Obligations*
02/09/71-12/31/88 FY89: TOTAL: \$2,115,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hanson, W. B. HQ-ES/Mellott, M. M. 31-Atmos Sci
Heelis, R. A. HQ-ES/Parks, G. K.

NAG 9-146 University of Texas - El Paso 5881
Vibration frequencies of tapered bars with nonclassical boundary conditions
Period *Obligations*
06/01/86-01/15/90 FY89: TOTAL: \$167,128
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Craver, W. L., Jr. JSC/Holder, B. W. 46-Mech Engr

NAG 9-281 University of Texas - El Paso 5882
Fracture criteria for beryllium sheets
Period *Obligations*
04/01/88-09/01/89 FY89: TOTAL: \$77,885
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Guard, R. W. JSC/Castner, W. L. 47-Materials Engr

NAG 9-285 University of Texas - El Paso 5883
Improved knowledge acquisition and refinement through analogical explanation based learning
Period *Obligations*
04/01/88-06/01/89 FY89: TOTAL: \$85,938
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Patterson, D. JSC/Healey, K. 22-Computer Science

NAG 9-382 University of Texas - El Paso 5884
Vibration frequencies of flexible robot arms
Period *Obligations*
06/01/89-06/01/90 FY89: \$56,600 TOTAL: \$56,600
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Craver, W. L. JSC/Rocha, A. R. 46-Mech Engr

NAS 8-37425 University of Texas - El Paso 5885
The effect of impurity gases on variable polarity plasma arc VPPA welded aluminum
Period *Obligations*
04/05/88-09/04/89 FY89: TOTAL: \$85,438
Prin. Invest. *NASA Tech. Officer* *CASE Category*
McClure, J. C. MSFC/Nunes, A. C. 47-Materials Engr
MSFC/Bayless, E. O.

NCA 2-350 University of Texas - El Paso 5886
An assessment of research areas for extension and implementation of the di-mod project in the America's
Period *Obligations*
10/01/88-09/30/89 FY89: TOTAL: \$24,950
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Riter, S. ARC/Sebesta, P. D. 39-Env Sci, NEC

NGT 00-070-086 University of Texas - El Paso 5887
Graduate student researchers underrepresented minority focus program
Period *Obligations*
09/01/88-08/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
McClure, J. C. HQ-XE/Owens, F. C. 49-Engr, NEC

NGT 00-070-087 University of Texas - El Paso 5888
Graduate student researchers underrepresented minority focus program
Period *Obligations*
09/01/88-08/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
McClure, J. C. HQ-XE/Owens, F. C. 49-Engr, NEC

NGT 00-070-112 University of Texas - El Paso 5889
NASA graduate student minority program
Period *Obligations*
01/01/89-05/31/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Craver, W. L. HQ-XE/Owens, F. C. 46-Mech Engr

NAG 2-26 Univ of Texas Medical Branch - Galveston 5890
Central otolithic mechanisms in non-human primates
Period *Obligations*
01/01/80-11/30/89 FY89: \$70,000 TOTAL: \$622,167
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Perachio, A. A. ARC/Dauntun, N. G. 51-Biological Sci
Carreta, M. J. ARC/Corcoran, M. L.
Kevette, G. A.

NAG 2-186 Univ of Texas Medical Branch - Galveston 5891
Investigations of otolith responses using ground based vestibular research facility
Period *Obligations*
07/01/82-06/30/89 FY89: TOTAL: \$290,577
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Correia, M. J. ARC/Tomko, D. L. 51-Biological Sci
Perachio, A. A. ARC/Kirk, P. J.
Anderson, D. J.

**NASA'S UNIVERSITY PROGRAM
TEXAS (Continued)**

NAG 2-260 Univ of Texas Medical Branch - Galveston 5892

The identification and pharmacology of neurotransmitters in the vestibular nuclei

<i>Period</i>	<i>Obligations</i>	
12/01/83-12/31/89	FY89: \$61,000	TOTAL: \$410,775
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Gallagher, J. P.	ARC/Daunton, N. G.	51-Biological Sci
	ARC/Corcoran, M. L.	

NAG 2-293 Univ of Texas Medical Branch - Galveston 5893

Morphological and electrophysiological studies of the vestibular afferent efferent system

<i>Period</i>	<i>Obligations</i>	
04/01/84-03/31/90	FY89: \$28,000	TOTAL: \$385,994
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Correia, M. H.	ARC/Connolly, J. P.	51-Biological Sci
	ARC/Corcoran, M. L.	

NAG 2-446 Univ of Texas Medical Branch - Galveston 5894

Vestibular primary afferents in normal hyper- and hypogravity

<i>Period</i>	<i>Obligations</i>	
03/01/87-11/30/89	FY89: \$137,382	TOTAL: \$288,877
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Correia, M. J.	ARC/Connolly, J. P.	51-Biological Sci
Perachio, A. A.	ARC/Ballard, R. W.	

NAG 9-170 Univ of Texas Medical Branch - Galveston 5895

Effect of psychological stress on immune dysfunction

<i>Period</i>	<i>Obligations</i>	
08/01/86-06/01/89	FY89:	TOTAL: \$126,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Meehan, R. T.	JSC/Taylor, G. R.	56-Medical Sciences

NAG 9-172 Univ of Texas Medical Branch - Galveston 5896

The mechanism of the development in humans of disuse muscle atrophy

<i>Period</i>	<i>Obligations</i>	
09/01/86-02/01/90	FY89: \$100,000	TOTAL: \$358,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Stuart, C. A.	JSC/Cintron, N. M.	56-Medical Sciences
Prince, M. J.		
Wolfe, R. R.		

NAG 9-306 Univ of Texas Medical Branch - Galveston 5897

Peptide hormone receptor regulation on human peripheral blood mononuclear cells

<i>Period</i>	<i>Obligations</i>	
08/01/88-08/01/89	FY89:	TOTAL: \$30,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Meehan, R. T.	JSC/Sams, C. F.	56-Medical Sciences
Cintron, N. M.		

NAG 9-315 Univ of Texas Medical Branch - Galveston 5898

Maladjustment of kidneys to microgravity design of measures to reduce the loss of calcium

<i>Period</i>	<i>Obligations</i>	
09/01/88-08/31/89	FY89:	TOTAL: \$13,636
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Nechay, B. R.	JSC/Goldstein, S. H.	19-Phys Sci, NEC

NGT 00-050-165 Univ of Texas Medical Branch - Galveston 5899

NASA graduate student researchers program

<i>Period</i>	<i>Obligations</i>	
09/01/87-08/31/90	FY89: \$18,000	TOTAL: \$36,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Perachio, A. A.	HQ-XE/Owens, F. C.	51-Biological Sci

NAG 9-152 Univ of Texas, Health Sci Ctr-Dallas 5900

Renal stone formation study

<i>Period</i>	<i>Obligations</i>	
05/01/86-05/01/90	FY89: \$120,000	TOTAL: \$399,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Pak, C. Y.	JSC/Cintron, N. M.	56-Medical Sciences
Nicar, M.		

NAG 9-267 Univ of Texas, Health Sci Ctr-Dallas 5901

A three dimensional approach to endocardiographic ventricular volumes

<i>Period</i>	<i>Obligations</i>	
01/01/88-12/01/89	FY89:	TOTAL: \$30,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Buckey, J. C.	JSC/Charles, J. B.	56-Medical Sciences
Zoghbi, W. A.		

NAG 9-297 Univ of Texas, Health Sci Ctr-Dallas 5902

Firness autonomic regulation and orthostatic tolerance

<i>Period</i>	<i>Obligations</i>	
05/01/88-08/01/90	FY89: \$70,000	TOTAL: \$150,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Buckey, J. C.	JSC/Charles, J. B.	56-Medical Sciences

NAS 9-16044 Univ of Texas, Health Sci Ctr-Dallas 5903

Cardiovascular adaption to zero gravity

<i>Period</i>	<i>Obligations</i>	
01/17/80-12/01/90	FY89: \$616,992	TOTAL: \$3,711,600
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Blomqvist, G.	JSC/Young, W.	56-Medical Sciences

NAS 9-17167 Univ of Texas, Health Sci Ctr-Dallas 5904

Services of SL-4 payload specialist

<i>Period</i>	<i>Obligations</i>	
01/20/84-01/01/90	FY89: \$183,000	TOTAL: \$1,069,435
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Gaffney, F. A.	JSC/Womack, W.	49-Engr, NEC

NAS 9-18139 Univ of Texas, Health Sci Ctr-Dallas 5905

Life sciences flight experiment cardiovascular regulation at zero-G

<i>Period</i>	<i>Obligations</i>	
09/01/89-11/01/89	FY89: \$89,800	TOTAL: \$89,800
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Blomqvist, G.	JSC/Young, W.	56-Medical Sciences

NGT 00-050-206 Univ of Texas, Health Sci Ctr-Dallas 5906

NASA graduate student researchers program

<i>Period</i>	<i>Obligations</i>	
06/01/87-05/31/89	FY89:	TOTAL: \$35,500
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Blomqvist, C. G.	HQ-XE/Owens, F. C.	69-Psych, NEC

NGT 44-080-800 Univ of Texas, Health Sci Ctr-Dallas 5907

NASA graduate student researchers program

<i>Period</i>	<i>Obligations</i>	
05/01/85-04/30/90	FY89:	TOTAL: \$36,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Templeton, G. H.	HQ-LE/Owens, F. C.	13-Physics

**NASA'S UNIVERSITY PROGRAM
TEXAS (Continued)**

NAG 2-239 Univ. of Texas-Hlth Science Ctr-Houston 5908
Biochemical adaptations of anti-gravity muscle fibers to disuse atrophy
Period *Obligations*
07/01/83-11/30/89 FY89: \$105,900 TOTAL: \$390,219
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Booth, F. W. ARC/Grindeland, R. E. 56-Medical Sciences

NAG 9-193 Univ. of Texas-Hlth Science Ctr-Houston 5909
Prevention of bed rest induced disuse osteoporosis effect of amino hydroxypropylidene bisphosphonate
Period *Obligations*
12/01/86-06/01/90 FY89: TOTAL: \$348,600
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Steiner, A. JSC/Harris, B. 56-Medical Sciences
Leblanc, A.

NAG 9-215 Univ. of Texas-Hlth Science Ctr-Houston 5910
Prevention of bed rest induced disuse osteoporosis effect of amino hydroxypropylidene bisphosphonate
Period *Obligations*
01/01/87-01/01/90 FY89: \$50,000 TOTAL: \$142,062
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Butler, B. D. JSC/Waligora, J. M. 56-Medical Sciences

NAG 9-335 Univ. of Texas-Hlth Science Ctr-Houston 5911
Evaluation of physiologic changes associated with microgravity
Period *Obligations*
01/01/89-01/01/90 FY89: \$163,100 TOTAL: \$163,100
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Schneider, V. JSC/Pool, S. 56-Medical Sciences

NAS 9-17403 Univ. of Texas-Hlth Science Ctr-Houston 5912
Research in biological separations and cell culture
Period *Obligations*
06/01/85-10/31/89 FY89: TOTAL: \$3,253,700
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Tom, B. H. JSC/Morrison, D. R. 51-Biological Sci

NCC 2-423 Univ. of Texas-Hlth Science Ctr-Houston 5913
Chondrogenesis in micromass cultures of embryonic limb mesenchyme
Period *Obligations*
05/01/86-11/30/89 FY89: \$153,589 TOTAL: \$384,767
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Duke, C. ARC/Winget, C. M. 51-Biological Sci
ARC/Ballard, R. W.

NCC 2-558 Univ. of Texas-Hlth Science Ctr-Houston 5914
Analysis of neuromodular effects on hair cell adaptation
Period *Obligations*
07/01/88-06/30/90 FY89: \$90,461 TOTAL: \$90,461
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Crow, T. J. ARC/Tomko, D. L. 51-Biological Sci
ARC/Kirk, P. J.

NAG 2-442 Univ of Texas-Hlth Sci Ctr-San Antonio 5915
Effects of microgravity on the statocyst of aplysia californica
Period *Obligations*
03/01/87-12/31/89 FY89: \$43,650 TOTAL: \$126,680
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wiederhold, M. L. ARC/Ross, M. D. 51-Biological Sci
Smith, N. K. ARC/Oyama, J.
Sheridan, C. E.

NAG 9-250 Univ of Texas-Hlth Sci Ctr-San Antonio 5916
Bone growth kinetics in nonhuman primate
Period *Obligations*
07/15/87-01/01/89 FY89: TOTAL: \$49,250
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Holt, G. R. JSC/Schenider, V. S. 56-Medical Sciences

NAG 3-867 University of Texas at San Antonio 5917
Advanced methodologies for probabilistic constitutive relationships of material strength models
Period *Obligations*
01/12/88-02/10/90 FY89: \$50,873 TOTAL: \$71,609
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Boyce, L. LERC/Chamis, C. C. 41-Aero Engr
LERC/Johns, R. H.

NAGW 1254 University of Texas at San Antonio 5918
Two dimensional analysis of dayside ionospheric electrodynamics
Period *Obligations*
10/01/87-09/30/88 FY89: TOTAL: \$30,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Saflekos, N. A. HQ-EE/Theis, R. F. 13-Physics
HQ-EE/Eastman, T. E.

NAGW 1663 University of Texas at San Antonio 5919
Two dimension analysis of dayside ionosphere electrodynamics
Period *Obligations*
12/01/88-11/30/89 FY89: \$32,000 TOTAL: \$32,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Saflekos, N. A. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Perry, T. W.

NCC 2-618 University of Texas at San Antonio 5920
Durability of composites the further development of constitutive and failure laws
Period *Obligations*
06/01/89-05/31/90 FY89: \$75,000 TOTAL: \$75,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Brinson, H. F. ARC/Nelson, H. G. 47-Materials Engr
Hiel, C.

UTAH

NAG 1-608 University of Utah 5921
Characterization of vapors related to organometallic vapor phase epitaxy OMVPE growth of ALGAINP
Period *Obligations*
07/01/85-06/30/89 FY89: TOTAL: \$127,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Stringfellow, G. B. LARC/Clark, I. O. 43-Chem Engr
LARC/Hendricks, H. D.

NAG 1-705 University of Utah 5922
Fractography of composite delamination
Period *Obligations*
10/06/86-10/05/89 FY89: \$22,344 TOTAL: \$117,344
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bascom, W. D. LARC/Crews, J. H. 47-Materials Engr
LARC/Johnston, N. J.

NASA'S UNIVERSITY PROGRAM
UTAH (Continued)

NAG 1-706 **University of Utah** **5923**
 Surface and interfacial properties of carbon fibers
Period *Obligations*
 10/20/86-10/19/89 FY89: \$50,011 TOTAL: \$175,011
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Bascom, W. D. LARC/Hinkley, J. A. 47-Materials Engr
 LARC/Johnston, N. J.

NAG 3-789 **University of Utah** **5931**
 Reliability of structural ceramissin multiaxial loading
Period *Obligations*
 03/15/87-04/13/90 FY89: \$75,000 TOTAL: \$194,505
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Shetty, D. K. LERC/Gyekenyesi, J. P. 47-Materials Engr
 LERC/Manderscheid, J. M.

NAG 1-718 **University of Utah** **5924**
 Experimental and theoretical program for sub visual Cirrus cloud research
Period *Obligations*
 12/01/86-05/31/88 FY89: TOTAL: \$76,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Sassen, K. LARC/Alvarez, J. M. 31-Atmos Sci
 Liou, K. N. LARC/Poole, L. R.

NAG 5-127 **University of Utah** **5932**
 Global scale diagnosis of satellite data
Period *Obligations*
 07/01/81-12/31/89 FY89: \$19,175 TOTAL: \$384,647
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Paegle, J. N. GSFC/Helfand, H. M. 31-Atmos Sci

NAG 1-868 **University of Utah** **5925**
 Lidar studies of thin cirrus for fire
Period *Obligations*
 06/01/88-05/31/90 FY89: \$41,500 TOTAL: \$74,500
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Sassen, K. LARC/McDougal, D. S. 31-Atmos Sci
 LARC/Wagner, H. S.

NAG 5-732 **University of Utah** **5933**
 Verification and devesing a seasonal/monthly two dimensional climate model
Period *Obligations*
 01/20/86-03/31/89 FY89: TOTAL: \$244,500
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Ou, S. S. GSFC/Chou, M. 31-Atmos Sci
 Liou, K.

NAG 1-1048 **University of Utah** **5926**
 Radiation program in support of remote sensing of cirrus clouds
Period *Obligations*
 10/01/89-09/30/90 FY89: \$35,000 TOTAL: \$35,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Liou, K. N. LARC/Minnis, P. 31-Atmos Sci
 Takano, Y. LARC/Harrison, E. F.

NAG 5-1050 **University of Utah** **5934**
 Surface radiation retrieval methodologies using Helpe data
Period *Obligations*
 05/15/88-01/14/90 FY89: \$112,600 TOTAL: \$167,600
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Liou, K. N. GSFC/Chou, M. D. 31-Atmos Sci

NAG 1-1049 **University of Utah** **5927**
 Surface and interfacial properties of carbon fibers
Period *Obligations*
 10/01/89-09/30/90 FY89: \$21,316 TOTAL: \$21,316
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Bascom, W. D. LARC/Hinkley, J. A. 47-Materials Engr
 LARC/Johnston, N. J.

NAGW 1547 **University of Utah** **5935**
 Coupling between magnetospheric precipitation and convection patterns on both global and are scales
Period *Obligations*
 01/01/89-12/31/89 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Sojka, J. J. HQ-ES/Mellott, M. M. 13-Physics
 HQ-ES/Perry, T. W.

NAG 2-435 **University of Utah** **5928**
 Comprehensive analysis of the structure of the vertebrae from immobilized and reambulated monkeys
Period *Obligations*
 03/01/87-02/28/90 FY89: \$72,750 TOTAL: \$195,750
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Jee, W. S. ARC/Arnaud, S. B. 51-Biological Sci

NAS 1-18833 **University of Utah** **5936**
 Characterizing the fracture toughness of advanced composite structures
Period *Obligations*
 12/08/88-12/07/91 FY89: \$116,000 TOTAL: \$116,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Nairn, J. A. LARC/Crews, J. H. 41-Aero Engr
 LARC/Harris, C. E.

NAG 2-444 **University of Utah** **5929**
 The friction and wear of TPS fibers
Period *Obligations*
 04/01/87-08/31/89 FY89: TOTAL: \$54,720
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Bascom, W. ARC/Kourtides, D. A. 13-Physics

NAS 1-18883 **University of Utah** **5937**
 Effects of matrix and interphase on carbon fiber composite compression strength
Period *Obligations*
 03/31/89-03/30/94 FY89: \$107,000 TOTAL: \$107,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Bascom, W. D. LERC/Hinkley, J. A. 46-Mech Engr
 LERC/Crews, J. H.

NAG 3-327 **University of Utah** **5930**
 Backward-wave oscillators for the frequency range from 600ghz to 1800ghz
Period *Obligations*
 10/30/82-07/31/89 FY89: \$83,000 TOTAL: \$883,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Grow, R. W. LERC/Heighway, J. 45-Elec Engr
 Barnett, L. R. LERC/Stankiewicz, N.
 Baird, J. M.

NAS 5-28753 **University of Utah** **5938**
 LANDSAT thematic mapper data investigation: A reconstruction of high levels of Great Salt Lake, Utah in Lake Holocene time
Period *Obligations*
 08/15/85-07/31/89 FY89: TOTAL: \$294,840
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Currey, D. R. GSFC/Oseroff, H. 32-Geological Sci

NASA'S UNIVERSITY PROGRAM
UTAH (Continued)

NAG 1-899	Utah State University		5939
	Phase A sensor design study for the infrared limb experiment IRLE program		
	<i>Period</i>	<i>Obligations</i>	
	07/13/88-07/12/89	FY89: \$21,000	TOTAL: \$100,345
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Baker, D. J.	LARC/Russell, J. M., III	31-Atmos Sci
		LARC/Sullivan, E. M.	
NAG 3-792	Utah State University		5940
	Data analysis and interretation related to space system environments intereactions at Leo altitude		
	<i>Period</i>	<i>Obligations</i>	
	05/01/87-12/15/89	FY89:	TOTAL: \$100,040
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Raitt, W. J.	LERC/Purvis, C. K.	19-Phys Sci, NEC
	Schunk, R. W.		
NAG 5-603	Utah State University		5941
	Experimental studies of turbulent electrostatic waves in equatorial spread F, the equatorial electrojet and in two active space plasma events		
	<i>Period</i>	<i>Obligations</i>	
	03/01/82-10/31/89	FY89:	TOTAL: \$507,779
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Baker, K. D.	GSFC/Early, L. J.	13-Physics
	Howlett, L. C.	GSFC/Pless, R. H.	
	St Maurice, J. P.		
NAG 5-607	Utah State University		5942
	Sounding rocket experiments using tethered payloads		
	<i>Period</i>	<i>Obligations</i>	
	07/01/82-09/30/89	FY89:	TOTAL: \$610,006
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Raitt, W. J.	GSFC/Early, L. J.	13-Physics
	Williamson, P. R.	GSFC/Pless, R. H.	
	Parish, J. L.		
NAG 5-658	Utah State University		5943
	Charge 2b rocket experiment		
	<i>Period</i>	<i>Obligations</i>	
	08/01/89-07/31/90	FY89: \$74,664	TOTAL: \$74,664
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Raitt, W. J.	GSFC/Early, L. J.	13-Physics
		GSFC/Pless, R. H.	
NAG 5-748	Utah State University		5944
	Global dynamic ionospheric modeling		
	<i>Period</i>	<i>Obligations</i>	
	03/15/86-06/30/88	FY89:	TOTAL: \$80,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Sojka, J. J.	GSFC/Bullock, G. D.	19-Phys Sci, NEC
	Schunk, R. W.	GSFC/Hoffman, R. A.	
NAGW 77	Utah State University		5945
	The flow of plasma in the solar terrestrial environment		
	<i>Period</i>	<i>Obligations</i>	
	07/01/80-09/30/89	FY89: \$225,000	TOTAL: \$1,862,400
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Schunk, R. W.	HQ-ES/Mellott, M. M.	39-Env Sci, NEC
		HQ-EE/Curtis, S. A.	
NAGW 1540	Utah State University		5946
	Bispectral analysis of wave data		
	<i>Period</i>	<i>Obligations</i>	
	01/01/89-12/31/89	FY89: \$29,919	TOTAL: \$29,919
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Labelle, J. W.	HQ-ES/Mellott, M. M.	13-Physics
		HQ-ES/Perry, T. W.	
NAGW 1556	Utah State University		5947
	The nightward flow of energy and momentum in the Venus ionosphere		
	<i>Period</i>	<i>Obligations</i>	
	11/01/88-10/31/89	FY89: \$45,000	TOTAL: \$45,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Miller, K. L.	HQ-EL/Bergstralh, J. T.	31-Atmos Sci
NAGW 1817	Utah State University		5948
	Charge 2b		
	<i>Period</i>	<i>Obligations</i>	
	03/01/89-02/28/90	FY89: \$213,600	TOTAL: \$213,600
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Raitt, W. J.	HQ-ES/Mellott, M. M.	39-Env Sci, NEC
		HQ-ES/Perry, T. W.	
NAG10-14	Utah State University		5949
	Gravitropism in leafy dicot stems		
	<i>Period</i>	<i>Obligations</i>	
	01/29/85-10/31/88	FY89:	TOTAL: \$161,475
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Salisbury, F. B.	KSC/Knott, W. M.	32-Geological Sci
NAG10-63	Utah State University		5950
	Changing sensitivity to auxin in stem gravitropism		
	<i>Period</i>	<i>Obligations</i>	
	07/01/89-01/02/90	FY89: \$10,000	TOTAL: \$10,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Salisbury, F. B.	KSC/Knott, W. M.	54-Env Biology
NAS 1-18682	Utah State University		5951
	Measurement and modeling of joint damping		
	<i>Period</i>	<i>Obligations</i>	
	05/10/88-09/11/89	FY89:	TOTAL: \$94,500
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Redd, F. J.	LARC/Clark, L. G.	42-Astro Engr
		LARC/Lake, M. S.	
NAS 5-29422	Utah State University		5952
	Stepper motor driver cryogenic valve		
	<i>Period</i>	<i>Obligations</i>	
	02/07/86-06/30/89	FY89:	TOTAL: \$322,064
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Haycock, R.	GSFC/Figueroa, O.	42-Astro Engr
		GSFC/Dipirro, M.	
NAS 8-37110	Utah State University		5953
	Research on orbital plasma electrodynamics		
	<i>Period</i>	<i>Obligations</i>	
	05/04/87-10/25/91	FY89: \$3,000	TOTAL: \$9,000
	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
	Stone, N.	MSFC/Duncan, B.	31-Atmos Sci
	Schunk, R.	MSFC/Holder, R.	

NASA'S UNIVERSITY PROGRAM

UTAH (Continued)

NAS 8-37754 **Utah State University** **5954**
Control of flexible robot manipulators in zero gravity
Period *Obligations*
08/15/88-08/14/89 FY89: TOTAL: \$87,481
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Phillips, W. F. MSFC/Nelson, P. J. 46-Mech Engr

NCA 2-365 **Utah State University** **5955**
Environmental definition for the crop growth research chamber
Period *Obligations*
10/15/88-10/14/90 FY89: \$30,000 TOTAL: \$30,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bugbee, B. ARC/Bubenheim, D. L. 49-Engr, NEC

NCC 2-139 **Utah State University** **5956**
Studies on maximum yield of wheat and other small grains in controlled environments
Period *Obligations*
05/01/81-04/30/90 FY89: \$171,165 TOTAL: \$929,043
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Salisbury, F. B. ARC/MacElroy, R. D. 51-Biological Sci
Bugbee, B.

VERMONT

NAG 5-992 **Bennington College** **5957**
Remote sensing studies of forest pattern and process
Period *Obligations*
09/01/87-02/28/89 FY89: TOTAL: \$14,790
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Woods, K. D. GSFC/Hall, F. 31-Atmos Sci

NAG 5-762 **Middlebury College** **5958**
Global models of coronae structures observed with Solar Maximum Mission coronagraph polarimeters
Period *Obligations*
04/15/86-11/14/89 FY89: TOTAL: \$98,410
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wolfson, R. GSFC/Bullock, G. D. 19-Phys Sci, NEC
GSFC/Gurman, J. B.

NAG 5-801 **Middlebury College** **5959**
A comparison of supernova ejects in a selected supernova remnant
Period *Obligations*
07/15/86-02/28/90 FY89: TOTAL: \$26,840
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Winkler, P. F. GSFC/Kondo, Y. 11-Astronomy
Kirshner, R. P.

NAG 8-735 **Middlebury College** **5960**
Heavy element enrichment in supernova remnants through their X ray spectra
Period *Obligations*
07/15/88-07/14/90 FY89: TOTAL: \$25,960
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Winkler, P. F. MSFC/Harper, B. A. 11-Astronomy

NAG 9-312 **Norwich University** **5961**
Multiprocessor techniques in data acquisition computers
Period *Obligations*
09/01/88-03/01/90 FY89: TOTAL: \$24,976
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bartram, P. N. JSC/Stilwell, D. 22-Computer Science

VIRGINIA

NAG 1-268 **Christopher Newport College** **5962**
Bacterial electrochemical asymmetry potential (BEAP)
Period *Obligations*
05/11/82-08/15/89 FY89: TOTAL: \$13,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Sacks, L. J. LARC/Rhinehart, R. P. 12-Chemistry

NAG 1-431 **Christopher Newport College** **5963**
Determination of sound speed and attenuation for ultrasonic waves in composite materials
Period *Obligations*
12/07/83-10/31/89 FY89: \$65,500 TOTAL: \$338,884
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Smith, B. T. LARC/Madaras, E. I. 13-Physics
Buoncrisiani, A. M. LARC/Heyman, J. S.

NAG 1-523 **Christopher Newport College** **5964**
Laser polymerization for space application
Period *Obligations*
09/18/84-01/31/90 FY89: TOTAL: \$34,975
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Chang, C. K. LARC/Conway, E. J. 12-Chemistry
LARC/Miner, G. A.

NAG 1-585 **Christopher Newport College** **5965**
Analysis of materials for a tunable solid state laser
Period *Obligations*
06/01/85-08/31/89 FY89: TOTAL: \$29,679
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Buoncrisiani, A. M. LARC/Brockman, P. 13-Physics

NAG 1-796 **Christopher Newport College** **5966**
Spectroscopy of tunable solid state laser materials
Period *Obligations*
07/06/87-08/31/90 FY89: \$96,260 TOTAL: \$364,275
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Buoncrisiani, A. M. LARC/Brockman, P. 13-Physics
LARC/Hess, R. V.

NAG 1-1036 **Christopher Newport College** **5967**
Theoretical study of radiation effects on composite material for space use
Period *Obligations*
06/15/89-02/28/90 FY89: \$13,800 TOTAL: \$13,800
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Chang, C. K. LARC/Wilson, J. W. 19-Phys Sci, NEC
LARC/Meador, W. E.

NAG 1-1042 **Christopher Newport College** **5968**
Development and testing of a superconducting link for an irradiative resistance IR detector
Period *Obligations*
07/19/89-07/18/90 FY89: \$39,997 TOTAL: \$39,997
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Caton, R. LARC/Wintree, W. P. 47-Materials Engr
Selim, R. LARC/Buckley, J. D.

**NASA'S UNIVERSITY PROGRAM
VIRGINIA (Continued)**

NSG 1614 Christopher Newport College 5969
Theoretical study of radiation effects in composite materials for space use
Period Obligations
07/01/79-08/31/88 FY89: \$1 TOTAL: \$189,099
Prin. Invest. NASA Tech. Officer CASE Category
Chang, C. K. LARC/Wilson, J. W. 19-Phys Sci, NEC
LARC/Conway, E. J.

NAG 1-237 College of William And Mary 5970
Characterization of relationship of cure cycle processing properties
Period Obligations
12/01/81-11/30/89 FY89: \$52,625 TOTAL: \$553,714
Prin. Invest. NASA Tech. Officer CASE Category
Kranbuehl, D. E. LARC/Long, E. R. 12-Chemistry
LARC/Dexter, B.

NAG 1-787 College of William And Mary 5971
Reliable real time processing of sensor data in embedded avionics computing systems
Period Obligations
06/16/87-07/07/90 FY89: \$89,313 TOTAL: \$257,450
Prin. Invest. NASA Tech. Officer CASE Category
Kearns, J. P. LARC/Sjogren, J. A. 22-Computer Science
Park, S. K.

NAG 1-824 College of William And Mary 5972
Incremental assessment and improvement of software reliability
Period Obligations
01/16/88-08/31/89 FY89: \$25,817 TOTAL: \$65,787
Prin. Invest. NASA Tech. Officer CASE Category
Morrell, L. J. LARC/Liceaga, C. A. 29-Math/Computer, NEC

NAG 1-884 College of William And Mary 5973
Toward a practical theory of ultra reliable software
Period Obligations
06/01/88-12/31/89 FY89: \$69,905 TOTAL: \$103,796
Prin. Invest. NASA Tech. Officer CASE Category
Miller, K. W. LARC/Eckhardt, D. E. 22-Computer Science
Noonan, R. E.
Park, S. K.

NAG 1-894 College of William And Mary 5974
Safety analysis of knowledge-based systems
Period Obligations
06/06/88-06/05/89 FY89: TOTAL: \$27,955
Prin. Invest. NASA Tech. Officer CASE Category
Morell, L. J. LARC/Johnson, S. C. 22-Computer Science

NAG 1-896 College of William And Mary 5975
Frequency dependent electromagnetic sensing for insitu monitoring of high performance thermoset and thermoplastic processing properties during cure
Period Obligations
07/01/88-08/31/89 FY89: TOTAL: \$82,800
Prin. Invest. NASA Tech. Officer CASE Category
Kranbuehl, D. E. LARC/Freeman, W. T. 12-Chemistry
LARC/Dexter, H. B.

NAG 1-906 College of William And Mary 5976
Collision detection testbed
Period Obligations
08/23/88-08/22/89 FY89: TOTAL: \$55,973
Prin. Invest. NASA Tech. Officer CASE Category
Bynum, W. L. LARC/Sliwa, N. E. 22-Computer Science

NAG 1-995 College of William And Mary 5977
The parallelization of ERBE earth radiation budget experiment data processing
Period Obligations
06/01/89-05/31/90 FY89: \$78,745 TOTAL: \$78,745
Prin. Invest. NASA Tech. Officer CASE Category
Nicol, D. M. LARC/Keynton, R. J. 22-Computer Science
LARC/Barkstrom, B. R.

NAG 1-1002 College of William And Mary 5978
Rapid reliable and performance integrated design over-coming the safety issue in future commercial aircraft fly-by wire systems
Period Obligations
04/19/89-04/18/90 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. NASA Tech. Officer CASE Category
Ring, L. J. LARC/Holt, H. M. 99-Multi-Discip
Rahtz, O. R. LARC/Bryant, W. H.

NAG 1-1019 College of William And Mary 5979
Frequency dependent electromagnetic sensing for in situ monitoring of high performance thermoset and thermoplastic processing properties during cure
Period Obligations
05/22/89-05/21/90 FY89: \$90,680 TOTAL: \$90,680
Prin. Invest. NASA Tech. Officer CASE Category
Kranbuehl, D. E. LARC/Long, E. R. 12-Chemistry

NAG 1-1060 College of William And Mary 5980
Parallelization of performability design tools
Period Obligations
09/01/89-08/31/90 FY89: \$25,000 TOTAL: \$25,000
Prin. Invest. NASA Tech. Officer CASE Category
Nichol, D. M. LARC/Bryant, W. H. 22-Computer Science

NAG 1-1063 College of William And Mary 5981
Quantitative nondestructive evaluation of materials and structures
Period Obligations
11/01/89-01/31/91 FY89: \$91,988 TOTAL: \$91,988
Prin. Invest. NASA Tech. Officer CASE Category
Smith, B. T. LARC/Madaras, E. I. 13-Physics

NAS 1-18347 College of William And Mary 5982
Physical mathematical and computer science research
Period Obligations
01/13/87-01/12/92 FY89: \$345,365 TOTAL: \$929,775
Prin. Invest. NASA Tech. Officer CASE Category
Kranbuehl, D. E. LARC/Prior, E. J. 99-Multi-Discip
LARC/Massenberg, S. E.

NCC 1-40 College of William And Mary 5983
Tire nonlinear model
Period Obligations
04/16/80-11/30/89 FY89: \$75,000 TOTAL: \$672,103
Prin. Invest. NASA Tech. Officer CASE Category
Anderson, C. M. LARC/Tanner, J. A. 46-Mech Engr
LARC/Robinson, M. P.

NCC 1-43 College of William And Mary 5984
Halogen occultation experiment (HALOE) science investigation
Period Obligations
08/01/80-12/31/89 FY89: \$77,236 TOTAL: \$512,376
Prin. Invest. NASA Tech. Officer CASE Category
Benner, D. C. LARC/Sullivan, E. M. 31-Atmos Sci
LARC/Russell, J. M., III

NASA'S UNIVERSITY PROGRAM
VIRGINIA (Continued)

NCC 1-77 College of William And Mary 5985
 Computational investigations of heterogeneous processes
Period Obligations
 03/01/83-10/31/88 FY89: TOTAL: \$81,055
Prin. Invest. NASA Tech. Officer CASE Category
 Krakauer, H. LARC/Phillips, D. H. 19-Phys Sci, NEC

NAG 2-343 Estrn Va Med Schl-Estrn Va Med Authority 5993
 Effects of weightlessness on aurelia ephyra differentiation
Period Obligations
 01/01/85-10/31/89 FY89: \$101,000 TOTAL: \$302,475
Prin. Invest. NASA Tech. Officer CASE Category
 Spangenberg, D. B. ARC/Ballard, R. W. 51-Biological Sci

NCC 1-80 College of William And Mary 5986
 High resolution spectroscopy to support atmospheric measurements
Period Obligations
 07/07/83-03/31/90 FY89: \$73,550 TOTAL: \$410,740
Prin. Invest. NASA Tech. Officer CASE Category
 Benner, D. C. LARC/Smith, M. A. 13-Physics
 Venkataraman, M. D. LARC/Rinsland, C. P.

NAG 2-508 Estrn Va Med Schl-Estrn Va Med Authority 5994
 Effect of weightlessness on aurelia ephyra differentiation
Period Obligations
 03/01/88-10/31/89 FY89: TOTAL: \$15,000
Prin. Invest. NASA Tech. Officer CASE Category
 Spangenberg, D. B. ARC/Winget, C. W. 51-Biological Sci
 ARC/Ballard, R. W.

NCC 1-122 College of William And Mary 5987
 Automatic determination of Fault effects on aircraft functionality
Period Obligations
 02/18/88-12/31/89 FY89: \$90,577 TOTAL: \$168,954
Prin. Invest. NASA Tech. Officer CASE Category
 Feyock, S. LARC/Schutte, P. C. 22-Computer Science

NAGW 1784 Estrn Va Med Schl-Estrn Va Med Authority 5995
 Development of aurelia graviceptors in cell culture media
Period Obligations
 04/01/89-03/31/90 FY89: \$10,000 TOTAL: \$10,000
Prin. Invest. NASA Tech. Officer CASE Category
 Spangenberg, D. B. HQ-EB/Halstead, T. 56-Medical Sciences

NCC 1-126 College of William And Mary 5988
 The effects of the interaction of polymeric materials with the space environment
Period Obligations
 06/16/88-06/15/90 FY89: \$46,000 TOTAL: \$58,026
Prin. Invest. NASA Tech. Officer CASE Category
 Kiefer, R. L. LARC/Long, S. T. 12-Chemistry
 Orwoll, R. A. LARC/Wood, G. M.

NAGW 1229 George Mason University 5996
 The fourth George Mason fall workshop in astrophysics supernova 1987A in the large magellanic cloud
Period Obligations
 10/01/87-09/30/89 FY89: TOTAL: \$16,011
Prin. Invest. NASA Tech. Officer CASE Category
 Kafatos, M. HQ-EZ/Kaluzienski, L. 11-Astronomy
 HQ-EZ/Buner, A. N.

NGT 00-050-052 College of William And Mary 5989
 NASA graduate student researchers program
Period Obligations
 08/16/86-09/15/89 FY89: TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
 Miller, K. HQ-LE/Owens, F. C. 22-Computer Science

NAG 1-400 Hampton University 5997
 Advanced solar energetics
Period Obligations
 09/01/83-12/31/89 FY89: \$140,904 TOTAL: \$880,916
Prin. Invest. NASA Tech. Officer CASE Category
 Venable, D. D. LARC/Meador, W. E. 13-Physics
 Tabibi, B. M. LARC/Conway, E. J.

NGT 00-050-111 College of William And Mary 5990
 NASA graduate student researchers program
Period Obligations
 06/01/87-05/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
 Park, S. K. HQ-LE/Owens, F. C. 22-Computer Science

NAG 1-441 Hampton University 5998
 Direct solar pumped iodine laser amplifier
Period Obligations
 03/01/84-11/30/89 FY89: \$68,077 TOTAL: \$410,996
Prin. Invest. NASA Tech. Officer CASE Category
 Han, K. S. LARC/Costen, R. C. 13-Physics
 Hwang, T. H. LARC/Conway, E. J.

NGT 00-050-117 College of William And Mary 5991
 NASA graduate student researchers program
Period Obligations
 06/01/87-05/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
 Park, S. K. HQ-LE/Owens, F. C. 22-Computer Science

NAG 1-477 Hampton University 5999
 Electron transport and charge buildup in multi layered configurations
Period Obligations
 09/01/84-12/31/89 FY89: \$142,917 TOTAL: \$305,251
Prin. Invest. NASA Tech. Officer CASE Category
 Buck, W. LARC/Townsend, L. W. 13-Physics
 LARC/Conway, E. J.

NGT 00-070-091 College of William And Mary 5992
 Graduate student researchers underrepresented minority focus program
Period Obligations
 06/01/88-05/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
 Kiefer, R. HQ-XE/Owens, F. C. 12-Chemistry
 Orwoll, R.

NAG 1-628 Hampton University 6000
 Chemical prevaporization for a hydrocarbon-fueled scramjet
Period Obligations
 01/01/86-12/31/87 FY89: \$116,106 TOTAL: \$116,106
Prin. Invest. NASA Tech. Officer CASE Category
 Yates, C. L. LARC/Northam, G. B. 41-Aero Engr
 LARC/Anderson, G. Y.

**NASA'S UNIVERSITY PROGRAM
VIRGINIA (Continued)**

NAG 1-656	Hampton University	6001	NAG 1-904	Hampton University	6009
Development of proton transport methods			Implications of pressure diffusion for shock waves		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
03/06/86-08/31/89	FY89: \$4,185	TOTAL: \$64,307	08/01/88-09/30/89	FY89:	TOTAL: \$108,224
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Buck, W. W.	LARC/Wilson, J. W.	13-Physics	Ram, R. B.	LARC/Harvey, W. D.	41-Aero Engr
	LARC/Siemp, W. S.				
NAG 1-666	Hampton University	6002	NAG 1-905	Hampton University	6010
Modeline and optimization study for space borne titanium doped sapphire laser system			Synthesis of monomers with pendent ethynyl groups for modified high performance thermoplastics		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
06/01/86-11/30/89	FY89:	TOTAL: \$178,710	09/01/88-12/15/89	FY89:	TOTAL: \$50,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Farrukh, U. O.	LARC/Brockman, P.	13-Physics	Nwokogu, G.	LARC/Hergenrother, P. M.	12-Chemistry
				LARC/Connell, J. W.	
NAG 1-760	Hampton University	6003	NAG 1-948	Hampton University	6011
The shape preserving interpolants using symbolic computation			The shape preserving interpolants using symbolic computation		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
05/14/87-10/31/88	FY89:	TOTAL: \$40,460	01/01/89-12/31/89	FY89: \$54,678	TOTAL: \$54,678
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Lam, M.	LARC/Smith, R. E.	21-Mathematics	Lam, M.	LARC/Smith, R. E.	21-Mathematics
	LARC/Shoosmith, J. N.			LARC/Shoosmith, J. N.	
NAG 1-767	Hampton University	6004	NAG 1-949	Hampton University	6012
Evaluation of on board hydrogen storage methods for high speed aircraft			Parallel architectures for planetary exploration requirements		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
05/01/87-12/15/89	FY89: \$15,000	TOTAL: \$175,955	01/12/89-01/11/90	FY89: \$58,309	TOTAL: \$58,309
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Adeyiga, A.	LARC/Norham, G. B.	43-Chem Engr	Cezzar, R.	LARC/Bryant, W. H.	22-Computer Science
Akyurtle, A.	LARC/Pellett, G. L.		Sen, R. K.	LARC/Young, S. D.	
Akyurtle, J. F.			Willis, R. A.		
NAG 1-768	Hampton University	6005	NAG 1-970	Hampton University	6013
Auto regressive representation for harmonis table processes			Plasma puff initiation of high coulomb transfer switches		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
06/01/87-12/15/89	FY89: \$15,000	TOTAL: \$116,803	02/08/89-02/07/90	FY89: \$99,440	TOTAL: \$99,440
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Miamec, A. G.	LARC/Hardin, J. C.	21-Mathematics	Venable, D. D.	LARC/Williams, M. D.	13-Physics
				LARC/Meador, W. E.	
NAG 1-789	Hampton University	6006	NAG 1-1035	Hampton University	6014
Graphics applications utilizing parallel processing			Modifying PASVART to solve nonlinear two-point boundary problems		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
09/01/87-12/31/89	FY89: \$43,853	TOTAL: \$97,515	06/01/89-10/31/89	FY89: \$13,104	TOTAL: \$13,104
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Walker, R. L.	LARC/Hogge, J. E.	29-Math/Computer, NEC	Fulton, J. P.	LARC/Thurston, G. A.	29-Math/Computer, NEC
	LARC/Lansing, D. L.			LARC/Nemeth, M. P.	
NAG 1-827	Hampton University	6007	NAG 5-929	Hampton University	6015
Quantitative measurement and analysis of optical constants			Cosmic ray induced single event upset phenomone in semiconductor devices		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
10/23/87-11/30/89	FY89: \$129,972	TOTAL: \$286,793	06/15/87-10/31/89	FY89:	TOTAL: \$590,391
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Lowe, C.	LARC/Williams, J. A.	13-Physics	Venable, D. D.	GSFC/Stassinopaios, E. G., III	31-Atmos Sci
	LARC/Williams, J. B.				
NAG 1-877	Hampton University	6008	NAG 9-333	Hampton University	6016
Mid infrared solid state lasers for spaceborne lidar			Minority university consortium study of space radiation effects on material, systems device		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
04/13/88-11/30/89	FY89: \$28,000	TOTAL: \$112,568	01/03/89-01/02/90	FY89: \$158,000	TOTAL: \$158,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Whitney	LARC/Brockman, P.	13-Physics	Adeyiga, A. A.	JSC/Herman, C.	19-Phys Sci, NEC

NASA'S UNIVERSITY PROGRAM
VIRGINIA (Continued)

NCC 1-125 Hampton University 6017
Air traffic control simulation
Period Obligations
06/02/88-12/15/89 FY89: \$11,000 TOTAL: \$66,000
Prin. Invest. NASA Tech. Officer CASE Category
Armstrong, H. B. LARC/Bergeron, H. P. 41-Aero Engr
LARC/Credeur, L.

NCC 1-137 Hampton University 6018
Alkali metal vapors for solar pumped lasers
Period Obligations
05/01/89-04/30/90 FY89: \$103,920 TOTAL: \$103,920
Prin. Invest. NASA Tech. Officer CASE Category
Han, K. S. LARC/De Young, R. J. 13-Physics

NGT 00-050-344 Hampton University 6019
NASA graduate student researchers program
Period Obligations
08/01/88-07/31/90 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Buck, W. W. HQ-XE/Owens, F. C. 13-Physics

NGT 47-020-800 Hampton University 6020
Summer faculty fellowship program in research
Period Obligations
01/01/82-12/31/89 FY89: \$17,000 TOTAL: \$1,376,690
Prin. Invest. NASA Tech. Officer CASE Category
Spencer, J. W. HQ-XE/McGee, A. S. 49-Engr, NEC
HQ-XE/Schwartz, E. T.

NAG 1-627 Longwood College 6021
Flow in compounds that model crystal growth in bridgman furnaces
Period Obligations
01/01/86-01/31/90 FY89: \$29,507 TOTAL: \$152,768
Prin. Invest. NASA Tech. Officer CASE Category
Barber, P. G. LARC/Fripp, A. L. 47-Materials Engr

NAG 3-794 Mary Washington College 6022
Synthesis of new diamine and dianhydride monomers for thermo oxidatively stable polyimides
Period Obligations
06/01/87-05/31/90 FY89: \$17,952 TOTAL: \$56,320
Prin. Invest. NASA Tech. Officer CASE Category
Gratz, R. F. LERC/Aiston, W. B. 12-Chemistry
LERC/Delvigs, P.

NAG 1-764 Norfolk State University 6023
Solution of elliptic partial differential equations on a multiprocessing system using ADA language
Period Obligations
04/15/87-10/15/89 FY89: \$15,000 TOTAL: \$133,340
Prin. Invest. NASA Tech. Officer CASE Category
Shah, S. N. LARC/Lambiotte, J. J. 29-Math/Computer, NEC
LARC/Shoosmith, J. N.

NAG 1-845 Norfolk State University 6024
Spectroscopic analysis and characterization of the optical properties of group I III vi2 lina K inse 2 crystals
Period Obligations
02/01/88-03/31/90 FY89: \$68,815 TOTAL: \$213,877
Prin. Invest. NASA Tech. Officer CASE Category
Miller, G. E. LARC/Barnes, J. C. 13-Physics

NAG 1-976 Norfolk State University 6025
Experiments in materials science engineering and technology
Period Obligations
01/24/89-01/23/90 FY89: \$25,865 TOTAL: \$25,865
Prin. Invest. NASA Tech. Officer CASE Category
Jacobs, J. A. LARC/Massenberg, S. E. 47-Materials Engr

NCC 1-115 Norfolk State University 6026
13c carbon nuclear magnetic resonance analysis of the effects of electron radiation on graphite polyetherimide composites
Period Obligations
04/01/87-09/30/88 FY89: TOTAL: \$54,937
Prin. Invest. NASA Tech. Officer CASE Category
Ferguson, M. W. LARC/Long, S. T. 13-Physics
Mattix, L.

NAG 1-336 Old Dominion University 6027
Passive damping concepts for space structures with natural or forced vibrations
Period Obligations
02/01/83-09/30/89 FY89: TOTAL: \$83,882
Prin. Invest. NASA Tech. Officer CASE Category
Razzaq, Z. LARC/Bush, H. G. 49-Engr, NEC
LARC/Mikulas Jr., M. M.

NAG 1-363 Old Dominion University 6028
Institute for computational and applied mechanics (ICAM)
Period Obligations
05/16/83-12/31/89 FY89: \$109,569 TOTAL: \$594,702
Prin. Invest. NASA Tech. Officer CASE Category
Tiwari, S. N. LARC/Massenberg, S. E. 41-Aero Engr
LARC/Prior, E. J.

NAG 1-423 Old Dominion University 6029
Analysis and computation of internal flow field in a scramjet engine
Period Obligations
10/19/83-01/14/90 FY89: \$49,557 TOTAL: \$186,056
Prin. Invest. NASA Tech. Officer CASE Category
Tiwari, S. N. LARC/Kumar, A. 41-Aero Engr
LARC/Dwoyer, D. L.

NAG 1-438 Old Dominion University 6030
Computational structural mechanics: Stress and postbuckling analysis procedures for composites using concurrent processing
Period Obligations
12/19/83-03/31/88 FY89: TOTAL: \$98,244
Prin. Invest. NASA Tech. Officer CASE Category
Razzag, Z. LARC/Storaasli, O. O. 46-Mech Engr
LARC/Bostic, S. W.

NAG 1-439 Old Dominion University 6031
Use of executable specifications machine learning theorem proving and knowledge based techniques in automated analysis of software specifications for production of highly reliable computer systems
Period Obligations
01/16/84-05/15/90 FY89: \$110,342 TOTAL: \$404,503
Prin. Invest. NASA Tech. Officer CASE Category
Wild, C. D. LARC/Eckhardt, D. E. 22-Computer Science
Zeil, S.

NAG 1-530 Old Dominion University 6032
Investigation of the stability of large vortices
Period Obligations
11/01/84-10/31/89 FY89: \$114,995 TOTAL: \$447,220
Prin. Invest. NASA Tech. Officer CASE Category
Ash, R. L. LARC/Anders, J. B. 41-Aero Engr
Grosch, C. E.

NASA'S UNIVERSITY PROGRAM
VIRGINIA (Continued)

NAG 1-569	Old Dominion University	6033	Chemoviscosity modeling of thermosetting resins <i>Period</i> 02/01/85-01/31/90 <i>Prin. Invest.</i> Tiwari, S. N. <i>Obligations</i> FY89: \$165,135 NASA Tech. Officer LARC/Baucom, R. M. LARC/Johnston, N. J. <i>CASE Category</i> 12-Chemistry TOTAL: \$360,988
NAG 1-735	Old Dominion University	6040	New devices for flow measurements hot film and buried wire sensors infrared imagery liquid crystal and piezo electric methods <i>Period</i> 01/05/87-12/31/89 <i>Prin. Invest.</i> McCree, G. J. Roberts, A. S. Albin, S. <i>Obligations</i> FY89: \$61,736 NASA Tech. Officer LARC/Holmes, H. K. LARC/Gray, D. L. <i>CASE Category</i> 45-Elec Engr TOTAL: \$265,552
NAG 1-626	Old Dominion University	6034	Airborne radar technology for wind shear detection <i>Period</i> 12/01/85-08/31/88 <i>Prin. Invest.</i> Hibey, J. L. <i>Obligations</i> FY89: \$121,312 NASA Tech. Officer LARC/Staton, L. D. LARC/Bracalente, E. M. <i>CASE Category</i> 45-Elec Engr TOTAL: \$121,312
NAG 1-736	Old Dominion University	6041	Guidance and control strategies for aerospace vehicles <i>Period</i> 01/01/87-10/15/89 <i>Prin. Invest.</i> Hibey, J. L. Naidu, D. S. <i>Obligations</i> FY89: \$80,000 NASA Tech. Officer LARC/Price, D. B. LARC/Queen, E. M. <i>CASE Category</i> 41-Aero Engr TOTAL: \$235,355
NAG 1-633	Old Dominion University	6035	Development of a numerical method for solving the three-dimensional viscous and inviscid transonic flow equations <i>Period</i> 02/15/86-11/14/89 <i>Prin. Invest.</i> Von Lavante, E. <i>Obligations</i> FY89: \$55,860 NASA Tech. Officer LARC/Salas, M. D. LARC/Keller, J. D. <i>CASE Category</i> 41-Aero Engr TOTAL: \$182,712
NAG 1-750	Old Dominion University	6042	Software reliability studies equivalence classes <i>Period</i> 04/01/87-03/31/90 <i>Prin. Invest.</i> Wilson, L. <i>Obligations</i> FY89: \$40,000 NASA Tech. Officer LARC/Hayhurst, K. J. LARC/Finelli, G. B. <i>CASE Category</i> 29-Math/Computer, NEC TOTAL: \$113,386
NAG 1-648	Old Dominion University	6036	Unsteady hybrid vortex technique for transonic vortex flows and flutter applications <i>Period</i> 02/16/86-11/15/89 <i>Prin. Invest.</i> Kandil, O. A. <i>Obligations</i> FY89: \$40,000 NASA Tech. Officer LARC/Bland, S. R. LARC/Whitlow, W. <i>CASE Category</i> 41-Aero Engr TOTAL: \$218,386
NAG 1-757	Old Dominion University	6043	Theoretical studies on solar lasers and converters <i>Period</i> 05/16/87-05/15/91 <i>Prin. Invest.</i> Heinbockel, J. H. <i>Obligations</i> FY89: \$107,582 NASA Tech. Officer LARC/Costen, R. C. LARC/Conway, E. J. <i>CASE Category</i> 13-Physics TOTAL: \$205,581
NAG 1-664	Old Dominion University	6037	A computational investigation of supersonic aerodynamic interference effects of store separation from a cavity <i>Period</i> 05/16/86-05/15/90 <i>Prin. Invest.</i> Baysal, O. <i>Obligations</i> FY89: \$76,539 NASA Tech. Officer LARC/Stallings, R. L., Jr. LARC/Miller, D. S. <i>CASE Category</i> 41-Aero Engr TOTAL: \$289,742
NAG 1-773	Old Dominion University	6044	Wave interactions in supersonic and hypersonic flows <i>Period</i> 05/01/87-09/30/89 <i>Prin. Invest.</i> Lakin, W. D. <i>Obligations</i> FY89: \$32,284 NASA Tech. Officer LARC/Erlebacher, G. <i>CASE Category</i> 41-Aero Engr TOTAL: \$60,131
NAG 1-683	Old Dominion University	6038	Strategies for concurrent processing of complex algorithms in data driven architectures <i>Period</i> 06/01/86-08/15/89 <i>Prin. Invest.</i> Stoughton, J. W. Mielke, R. R. <i>Obligations</i> FY89: \$249,705 NASA Tech. Officer LARC/Hayes, P. J. <i>CASE Category</i> 45-Elec Engr TOTAL: \$249,705
NAG 1-791	Old Dominion University	6045	Diamond film growth and properties <i>Period</i> 07/06/87-07/05/89 <i>Prin. Invest.</i> Albin, S. Lakdawala, V. K. <i>Obligations</i> FY89: \$114,705 NASA Tech. Officer LARC/Byvik, C. E. LARC/Hess, R. V. <i>CASE Category</i> 13-Physics TOTAL: \$114,705
NAG 1-716	Old Dominion University	6039	Wind tunnel magnetic suspension and balance systems <i>Period</i> 11/16/86-11/30/89 <i>Prin. Invest.</i> Britcher, C. P. <i>Obligations</i> FY89: \$154,486 NASA Tech. Officer LARC/Boyden, R. P. LARC/Kilgore, R. A. <i>CASE Category</i> 41-Aero Engr TOTAL: \$154,486
NAG 1-811	Old Dominion University	6046	Navier-Stokes analysis of cold scramjet afterbody flows <i>Period</i> 09/01/87-08/15/90 <i>Prin. Invest.</i> Baysal, O. Elshaky, M. E. Hoffman, W. B. <i>Obligations</i> FY89: \$172,457 NASA Tech. Officer LARC/Pittman, J. L. LARC/Miller, D. S. <i>CASE Category</i> 19-Phys Sci, NEC TOTAL: \$172,457
NAG 1-830	Old Dominion University	6047	Modal state estimation and reliable controller design for flexible structures <i>Period</i> 12/01/87-11/30/89 <i>Prin. Invest.</i> Huang, J. K. Chew, M. S. <i>Obligations</i> FY89: \$200,126 NASA Tech. Officer LARC/Juang, J. N. LARC/Cooley, V. <i>CASE Category</i> 42-Astro Engr TOTAL: \$200,126

NASA'S UNIVERSITY PROGRAM **VIRGINIA (Continued)**

NAG 1-835 Old Dominion University 6048
 Software reliability models and related topics methods for testing multiple software versions
Period Obligations
 01/01/88-12/31/89 FY89: \$55,420 TOTAL: \$105,303
Prin. Invest. NASA Tech. Officer CASE Category
 Lee, L. D. LARC/Eckhardt, D. E. 22-Computer Science

NAG 1-952 Old Dominion University 6056
 Design of novel joints for efficient articulation of manipulators
Period Obligations
 01/16/89-05/31/90 FY89: \$60,000 TOTAL: \$60,000
Prin. Invest. NASA Tech. Officer CASE Category
 Chew, M. S. LARC/Juang, J. N. 42-Astro Engr
 LARC/Horta, L. G.

NAG 1-838 Old Dominion University 6049
 Prediction of response of aircraft panels to acoustic and thermal loads
Period Obligations
 12/16/87-12/15/89 FY89: \$124,028 TOTAL: \$203,934
Prin. Invest. NASA Tech. Officer CASE Category
 Mei, C. LARC/Mixson, J. S. 41-Aero Engr
 Ash, R. LARC/Powell, C. A.

NAG 1-957 Old Dominion University 6057
 Modeling chromium Cr to thulium TM and Cr to TM to holmium HO energy transfer in yag yttrium aluminium gallium crystals
Period Obligations
 02/01/89-09/30/89 FY89: \$35,655 TOTAL: \$35,655
Prin. Invest. NASA Tech. Officer CASE Category
 Swetits, J. LARC/Brockman, P. 13-Physics
 LARC/Hess, R. V.

NAG 1-846 Old Dominion University 6050
 Analysis and mitigation of numerale dissipation in inviscid and viscid computations of vortex dominated flows
Period Obligations
 02/01/88-11/30/88 FY89: TOTAL: \$25,180
Prin. Invest. NASA Tech. Officer CASE Category
 Kandil, O. A. LARC/Liu, C. H. 41-Aero Engr
 LARC/Thomas, J. L.

NAG 1-962 Old Dominion University 6058
 Automated task learning decomposition and scheduling
Period Obligations
 01/16/89-01/15/90 FY89: \$79,267 TOTAL: \$79,267
Prin. Invest. NASA Tech. Officer CASE Category
 Livingston, D. L. LARC/Solonay, D. 22-Computer Science

NAG 1-858 Old Dominion University 6051
 Parallel procedures for statics eigen value analysis and structural dynamics
Period Obligations
 03/01/88-03/31/90 FY89: \$27,852 TOTAL: \$49,040
Prin. Invest. NASA Tech. Officer CASE Category
 Nguyen, D. T. LARC/Storaasli, O. O. 44-Civil Engr
 LARC/Bostic, S.

NAG 1-966 Old Dominion University 6059
 A project knowledge base for supporting software generation based on documenting decision dependencies
Period Obligations
 02/01/89-01/31/90 FY89: \$8,605 TOTAL: \$8,605
Prin. Invest. NASA Tech. Officer CASE Category
 Wild, C. LARC/Eckhardt, D. E. 22-Computer Science

NAG 1-881 Old Dominion University 6052
 Instability and noise propagation in supersonic jets
Period Obligations
 06/01/88-05/31/90 FY89: \$75,830 TOTAL: \$130,826
Prin. Invest. NASA Tech. Officer CASE Category
 Lakin, W. D. LARC/Pao, S. P. 41-Aero Engr

NAG 1-987 Old Dominion University 6060
 Vortex wake modelling and prediction
Period Obligations
 03/16/89-03/15/90 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. NASA Tech. Officer CASE Category
 Ash, R. L. LARC/Greene, G. C. 13-Physics

NAG 1-902 Old Dominion University 6053
 Evaluation and development of technologies for creation of reliable software
Period Obligations
 08/16/88-08/15/90 FY89: \$8,600 TOTAL: \$17,205
Prin. Invest. NASA Tech. Officer CASE Category
 Overstreet, C. M. LARC/Finelli, G. B. 29-Math/Computer, NEC

NAG 1-994 Old Dominion University 6061
 Analysis and control of supersonic vortex breakdown flows
Period Obligations
 03/16/89-12/31/89 FY89: \$46,241 TOTAL: \$46,241
Prin. Invest. NASA Tech. Officer CASE Category
 Kandil, O. A. LARC/Greene, G. C. 13-Physics

NAG 1-908 Old Dominion University 6054
 Extremely high data-rate reliable network systems research
Period Obligations
 09/02/88-06/30/90 FY89: \$30,918 TOTAL: \$39,523
Prin. Invest. NASA Tech. Officer CASE Category
 Maly, K. LARC/Murray, N. D. 22-Computer Science

NAG 1-1020 Old Dominion University 6062
 Hyperthermal atomic oxygen generator
Period Obligations
 05/18/89-05/17/90 FY89: \$15,495 TOTAL: \$15,495
Prin. Invest. NASA Tech. Officer CASE Category
 Khandelwal, G. S. LARC/Outlaw, R. A. 47-Materials Engr
 LARC/Meador, W. E.

NAG 1-920 Old Dominion University 6055
 A hyper graphics methodology and an information dictionary system for heterogeneous and by namic databases
Period Obligations
 11/01/88-10/31/89 FY89: \$8,605 TOTAL: \$8,605
Prin. Invest. NASA Tech. Officer CASE Category
 Shen, S. N. LARC/Shipman, F. S. 22-Computer Science

NAG 1-1026 Old Dominion University 6063
 Documenting the decision structure in software development
Period Obligations
 07/01/89-12/31/89 FY89: \$43,439 TOTAL: \$43,439
Prin. Invest. NASA Tech. Officer CASE Category
 Wild, J. C. LARC/Walker, C. K. 22-Computer Science
 Maly, K. Shen, S. N.

NASA'S UNIVERSITY PROGRAM
VIRGINIA (Continued)

NAG 1-1056 Old Dominion University 6064
 Large angle magnetic suspension test fixture
Period Obligations
 11/01/89-10/31/90 FY89: \$42,270 TOTAL: \$42,270
Prin. Invest. NASA Tech. Officer CASE Category
 Britcher, C. P. LARC/Groom, N. J. 49-Engr, NEC

NAG 9-308 Old Dominion University 6065
 An expert systems approach to automated maintenance for a generic system
Period Obligations
 08/01/88-12/01/89 FY89: TOTAL: \$20,000
Prin. Invest. NASA Tech. Officer CASE Category
 Ash, R. L. JSC/Roberts, B. B. 49-Engr, NEC
 Huang, J. K.

NAS 1-17993 Old Dominion University 6066
 Research in aerodynamics and related fields
Period Obligations
 03/05/85-03/04/90 FY89: TOTAL: \$2,039,200
Prin. Invest. NASA Tech. Officer CASE Category
 Kidd, C. LARC/Maddrea, G. L. 41-Aero Engr

NAS 1-18584 Old Dominion University 6067
 Research effort in the areas of aerodynamics fluid mechanics instrumentation avionics computing and other related fields
Period Obligations
 11/02/87-11/01/90 FY89: \$1,960,600 TOTAL: \$2,910,017
Prin. Invest. NASA Tech. Officer CASE Category
 Wolfson, B. E. LARC/Prior, E. D. 41-Aero Engr
 LARC/Massenberg, S. E.

NAS 1-18687 Old Dominion University 6068
 Passive damping augmentation for space manipulations
Period Obligations
 05/10/88-05/09/90 FY89: TOTAL: \$116,000
Prin. Invest. NASA Tech. Officer CASE Category
 Alberts, T. E. LARC/Clark, L. G. 42-Astro Engr
 LARC/Pennington, J. E.

NCC 1-42 Old Dominion University 6069
 A study of physical processes for space-radiation protection
Period Obligations
 06/04/80-05/15/90 FY89: \$91,250 TOTAL: \$675,783
Prin. Invest. NASA Tech. Officer CASE Category
 Khandelwal, G. S. LARC/Townsend, L. W. 13-Physics
 LARC/Conway, E. J.

NCC 1-68 Old Dominion University 6070
 Numerical solutions of three-dimensional Navier-Stokes equations for closed-bluff bodies
Period Obligations
 06/01/82-12/31/89 FY89: \$47,466 TOTAL: \$257,863
Prin. Invest. NASA Tech. Officer CASE Category
 Tiwari, S. N. LARC/Smith Jr., R. E. 41-Aero Engr
 Abolhassani, J. S. LARC/Shoosmith, J. N.
 Kathong, M.

NCC 1-90 Old Dominion University 6071
 Studies of molecular properties of polymeric materials
Period Obligations
 11/01/84-04/30/90 FY89: \$45,681 TOTAL: \$173,678
Prin. Invest. NASA Tech. Officer CASE Category
 Harries, W. L. LARC/Long, S. T. 13-Physics
 Ries, H. R. LARC/Long, E. R.

NCC 1-94 Old Dominion University 6072
 Space flight and experiment studies
Period Obligations
 03/01/85-12/31/89 FY89: \$204,449 TOTAL: \$1,379,427
Prin. Invest. NASA Tech. Officer CASE Category
 Brock, F. J. LARC/Melfi, L. T., Jr. 13-Physics
 Hueser, J. E. LARC/Sutton, K.

NCC 1-99 Old Dominion University 6073
 Geometric modeling for computer aided design
Period Obligations
 06/16/85-09/30/89 FY89: \$35,499 TOTAL: \$313,964
Prin. Invest. NASA Tech. Officer CASE Category
 Schwing, J. L. LARC/Rehder, J. J. 22-Computer Science
 LARC/McMillin, M. L.

NCC 1-120 Old Dominion University 6074
 Signal processing techniques for ambulatory fetal heart rate monitoring
Period Obligations
 01/16/88-01/15/90 FY89: \$43,403 TOTAL: \$81,403
Prin. Invest. NASA Tech. Officer CASE Category
 Stoughton, J. W. LARC/Gray, D. L. 45-Elec Engr

NCC 1-121 Old Dominion University 6075
 Navier-Stokes calculations of three-dimensional transonic cavity flow fields
Period Obligations
 01/16/88-08/31/88 FY89: TOTAL: \$20,762
Prin. Invest. NASA Tech. Officer CASE Category
 Baysal, O. LARC/Plentovich, E. B. 41-Aero Engr
 LARC/Gloss, B. B.

NCC 1-136 Old Dominion University 6076
 ATAMM algorithm to architecture mapping model enhancement and multiprocessor performance evaluation
Period Obligations
 03/16/89-03/15/90 FY89: \$458,785 TOTAL: \$458,785
Prin. Invest. NASA Tech. Officer CASE Category
 Stoughton, W. LARC/Hayes, P. J. 45-Elec Engr
 Mielke, R. R.

NGT 00-050-080 Old Dominion University 6077
 NASA graduate student researchers program
Period Obligations
 08/16/86-08/15/89 FY89: TOTAL: \$44,000
Prin. Invest. NASA Tech. Officer CASE Category
 Stoughton, J. W. HQ-LE/Owens, F. C. 45-Elec Engr

NGT 00-050-115 Old Dominion University 6078
 NASA graduate student researchers program
Period Obligations
 06/01/87-08/14/89 FY89: TOTAL: \$34,500
Prin. Invest. NASA Tech. Officer CASE Category
 Schoenbach, K. HQ-LE/Owens, F. C. 45-Elec Engr

NGT 00-050-118 Old Dominion University 6079
 NASA graduate student researchers program
Period Obligations
 06/01/87-05/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
 Albin, S. HQ-LE/Owens, F. C. 45-Elec Engr

**NASA'S UNIVERSITY PROGRAM
VIRGINIA (Continued)**

NGT 00-050-120 Old Dominion University 6080
NASA graduate student researchers program
Period Obligations
06/01/87-05/31/88 FY89: TOTAL: \$16,287
Prin. Invest. NASA Tech. Officer CASE Category
Coates, G. D. HQ-XE/Owens, F. C. 69-Psych, NEC

NGT 00-070-060 Old Dominion University 6089
NASA graduate student researchers program
Period Obligations
08/15/87-08/14/89 FY89: \$18,000 TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Freeman, F. HQ-XE/Owens, F. C. 99-Multi-Discip

NGT 00-050-260 Old Dominion University 6081
NASA graduate student researchers program
Period Obligations
08/16/88-08/31/89 FY89: TOTAL: \$14,956
Prin. Invest. NASA Tech. Officer CASE Category
Britcher, C. P. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 00-070-105 Old Dominion University 6090
NASA graduate student researchers underrepresented minority focus program
Period Obligations
10/01/88-12/31/89 FY89: \$15,771 TOTAL: \$15,771
Prin. Invest. NASA Tech. Officer CASE Category
Heinbackel, J. H. HQ-XE/Owens, F. C. 21-Mathematics

NGT 00-050-346 Old Dominion University 6082
NASA graduate student researchers program
Period Obligations
09/01/88-08/31/90 FY89: \$18,000 TOTAL: \$33,750
Prin. Invest. NASA Tech. Officer CASE Category
Switts, J. HQ-XE/Owens, F. C. 21-Mathematics

NGT 00-070-106 Old Dominion University 6091
Graduate student researchers underrepresented minority focus program
Period Obligations
10/01/88-09/30/89 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Wilson, L. HQ-XE/Owens, F. C. 22-Computer Science

NGT 00-050-395 Old Dominion University 6083
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Albin, S. HQ-XE/Owens, F. C. 45-Elec Engr

NGT 00-070-124 Old Dominion University 6092
NASA graduate student researchers underrepresented minority focus program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Alberts, T. E. HQ-XE/Owens, F. C. 21-Mathematics

NGT 00-050-399 Old Dominion University 6084
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Swetits, J. HQ-XE/Owens, F. C. 21-Mathematics

NGT 00-070-126 Old Dominion University 6093
NASA graduate student researchers program
Period Obligations
08/15/89-08/14/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Nuyen, D. T. HQ-XE/Owens, F. C. 44-Civil Engr

NGT 00-050-405 Old Dominion University 6085
NASA graduate student researchers program
Period Obligations
07/01/89-06/30/90 FY89: \$17,800 TOTAL: \$17,800
Prin. Invest. NASA Tech. Officer CASE Category
Coates, G. D. HQ-XE/Owens, F. C. 69-Psych, NEC

NGT 00-070-134 Old Dominion University 6094
NASA graduate student researchers underrepresented minority focus program
Period Obligations
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
McRee, G. J. HQ-XE/Owens, F. C. 45-Elec Engr

NGT 00-070-020 Old Dominion University 6086
NASA graduate student researchers program
Period Obligations
05/01/87-04/30/89 FY89: TOTAL: \$31,170
Prin. Invest. NASA Tech. Officer CASE Category
Mei, C. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 47-003-029 Old Dominion University 6095
Summer faculty fellowship program in research
Period Obligations
11/14/69-12/31/90 FY89: \$322,769 TOTAL: \$2,792,329
Prin. Invest. NASA Tech. Officer CASE Category
Tiwari, S. N. HQ-XE/McGee, A. S. 49-Engr, NEC
HQ-XE/Schwartz, E. T.

NGT 00-070-058 Old Dominion University 6087
NASA graduate student researchers program
Period Obligations
08/15/87-10/31/89 FY89: \$2,994 TOTAL: \$20,994
Prin. Invest. NASA Tech. Officer CASE Category
Brown, K. G. HQ-XE/Owens, F. C. 39-Env Sci, NEC

NGT 00-070-059 Old Dominion University 6088
NASA graduate student researchers program
Period Obligations
10/01/87-07/31/90 FY89: \$18,000 TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Stoughton, J. W. HQ-XE/Owens, F. C. 69-Psych, NEC

NSG 1321 Old Dominion University 6096
Concepts for structurally compatible thermal finite elements
Period Obligations
09/01/76-12/31/89 FY89: \$176,237 TOTAL: \$1,461,270
Prin. Invest. NASA Tech. Officer CASE Category
Thornton, E. A. LARC/Wieting, A. R. 49-Engr, NEC

NASA'S UNIVERSITY PROGRAM
VIRGINIA (Continued)

NSG 1568	Old Dominion University	6097	NAG 1-795	University of Virginia	6105
Theoretical study of solar pumped lasers			Supersonic combustion of hydrogen in air		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
12/15/78-04/30/90	FY89: \$53,909	TOTAL: \$433,152	07/01/87-12/31/90	FY89: \$225,000	TOTAL: \$875,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Harries, W. L.	LARC/Meador, W. E.	13-Physics	McDaniel, J. C.	LARC/Northan, G. B.	41-Aero Engr
	LARC/Conway, E. J.			LARC/Antcliff	
NAG 1-774	University of Richmond	6098	NAG 1-841	University of Virginia	6106
Design and implementation of a preprocessor for the ADA language to support the use of the multiway accept			Out of plane gradients in laminated composite structures		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
05/15/87-12/31/89	FY89: \$47,220	TOTAL: \$107,078	12/21/87-12/20/89	FY89: \$27,428	TOTAL: \$52,412
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Charlesworth, A.	LARC/Holloway, C. M.	22-Computer Science	Herakovich, C. T.	LARC/Starnes Jr., J. H.	41-Aero Engr
	LARC/Voigt, S. J.				
NAG 1-46	University of Virginia	6099	NAG 1-848	University of Virginia	6107
Numerical algorithms for finite element computations on arrays of microprocessors			Interpretation of the maps and aircraft measurements of the CO over the western hemisphere tropics		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
03/01/80-09/30/90	FY89: \$53,553	TOTAL: \$429,441	02/01/88-01/31/89	FY89:	TOTAL: \$16,425
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Ortega, J. M.	LARC/Storaasli, O. O.	49-Engr, NEC	Garstang, M.	LARC/Reichle Jr., H. G.	31-Atmos Sci
	LARC/Bostic, S. W.			LARC/Connors, V. S.	
NAG 1-242	University of Virginia	6100	NAG 1-1013	University of Virginia	6108
Research in computer science			Analysis of high speed flow thermal and structural interactions		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
12/01/81-01/31/90	FY89: \$78,300	TOTAL: \$704,300	06/01/89-05/31/90	FY89: \$260,045	TOTAL: \$260,045
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Ortega, J. M.	LARC/Bryant, W. H.	22-Computer Science	Thornton, E. A.	LARC/Wieting, A. R.	49-Engr, NEC
	LARC/Smith, K. A.				
NAG 1-350	University of Virginia	6101	NAG 1-1050	University of Virginia	6109
Stress effects in multilayers			Algorithms for fluids calculations		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
06/01/83-02/28/90	FY89: \$237,815	TOTAL: \$595,178	08/17/89-06/16/90	FY89: \$20,000	TOTAL: \$20,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Jesser, W. A.	ARC/Fripp, A. L.	47-Materials Engr	Ortega, J. M.	LARC/Zang, T. A.	13-Physics
Orazem, M. E.	LARC/Clark, I. O.				
NAG 1-373	University of Virginia	6102	NAG 3-630	University of Virginia	6110
Flowfield measurements in a model scramjet combustor using laser-induced iodine fluorescence			Computer communication networks for hierarchical control		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
07/01/83-08/31/88	FY89:	TOTAL: \$306,293	04/01/85-04/14/89	FY89:	TOTAL: \$174,996
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
McDaniel, J. C.	LARC/Northam, G. B.	41-Aero Engr	Weaver, A. C.	LERC/Delaat, J. C.	22-Computer Science
	LARC/Exton, R.		Colvin, M. A.	LERC/Lorenzo, C. F.	
NAG 1-701	University of Virginia	6103	NAG 3-909	University of Virginia	6111
Electro optic modulation for carbon monoxide monitoring			Magnetic actuators and suspension for space vibration control		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
10/01/86-12/31/89	FY89:	TOTAL: \$52,998	06/01/88-05/31/90	FY89: \$64,815	TOTAL: \$127,435
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Gallagher, T. F.	LARC/Sachse, G. W.	19-Phys Sci, NEC	Allaire, P. E.	LERC/Fleming, D. P.	46-Mech Engr
	LARC/Wallio, H. A.		Lewis, D. W.	LERC/Brown, G. V.	
			Williams, R. D.		
NAG 1-745	University of Virginia	6104	NAG 5-257	University of Virginia	6112
Light alloy technology program in aluminum lithium alloys			Ultraviolet studies of strong nuclear radio sources in normal spiral galaxies		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
04/01/87-04/30/90	FY89: \$483,097	TOTAL: \$845,417	09/01/82-09/30/90	FY89:	TOTAL: \$62,514
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Gangloff, R. P.	LARC/Dicus, D. L.	47-Materials Engr	Thuan, T. X.	GSFC/Kondo, Y.	11-Astronomy
Stoner, G. E.	LARC/Royster, D. M.				

**NASA'S UNIVERSITY PROGRAM
VIRGINIA (Continued)**

NAG 5-700 University of Virginia 6113
Ultraviolet imaging telescope astronomical observations
Period Obligations
09/01/85-10/31/91 FY89: \$196,605 TOTAL: \$518,989
Prin. Invest. NASA Tech. Officer CASE Category
O'Connell, R. W. GSFC/Stecher, T. P. 11-Astronomy
GSFC/Baker, G. R.

NAG 5-1264 University of Virginia 6121
Star formation in clusters of galaxies a combined infrared H alpha study
Period Obligations
09/15/89-12/14/89 FY89: \$7,800 TOTAL: \$7,800
Prin. Invest. NASA Tech. Officer CASE Category
Whittle, D. M. GSFC/West, D. 11-Astronomy

NAG 5-712 University of Virginia 6114
Wiskerless diode research
Period Obligations
10/01/85-12/31/89 FY89: \$17,500 TOTAL: \$106,823
Prin. Invest. NASA Tech. Officer CASE Category
Mattauch, R. J. GSFC/Bennett, C. L. 45-Elec Engr

NAG 5-1265 University of Virginia 6122
Far infrared emission from the intracluster medium and an IUE stellar library for analysis of composite ultraviolet spectra
Period Obligations
09/15/89-12/14/89 FY89: \$15,400 TOTAL: \$15,400
Prin. Invest. NASA Tech. Officer CASE Category
O'Connell, R. W. GSFC/West, D. 11-Astronomy

NAG 5-865 University of Virginia 6115
Microgravity nucleation and particle coagulation experiment support
Period Obligations
01/01/87-04/30/90 FY89: \$8,608 TOTAL: \$104,536
Prin. Invest. NASA Tech. Officer CASE Category
Lilleleht, L. U. GSFC/Nuth, J. A. 19-Phys Sci, NEC
GSFC/Allen, J. E.

NAG 8-657 University of Virginia 6123
The effects of latent heat release on synoptic to planetary scale wave
Period Obligations
08/01/87-09/01/90 FY89: \$53,406 TOTAL: \$102,750
Prin. Invest. NASA Tech. Officer CASE Category
Colucci, S. J. MSFC/Kaufman, J. W. 39-Env Sci, NEC

NAG 5-870 University of Virginia 6116
Design of the primary pre and TRMM ground truth site
Period Obligations
02/15/87-02/28/90 FY89: \$125,388 TOTAL: \$270,597
Prin. Invest. NASA Tech. Officer CASE Category
Garstang, M. GSFC/Thiele, O. W. 31-Atmos Sci

NAGW 186 University of Virginia 6124
Sputtering effects on the Jovian satellites and rings
Period Obligations
04/15/81-10/31/89 FY89: \$32,000 TOTAL: \$304,889
Prin. Invest. NASA Tech. Officer CASE Category
Johnson, R. E. HQ-EL/Underwood, J. 32-Geological Sci
HQ-EL/Boyce, J. M.

NAG 5-981 University of Virginia 6117
An IUE stellar library for analysis of composite ultraviolet splites
Period Obligations
09/01/87-12/31/89 FY89: TOTAL: \$33,377
Prin. Invest. NASA Tech. Officer CASE Category
O'Connell, R. W. GSFC/Kondo, Y. 11-Astronomy
Bohlin, R. C.
Burstein, D.

NAGW 461 University of Virginia 6125
Ion collisions of importance in the Io plasma torus
Period Obligations
09/01/83-11/30/89 FY89: \$29,499 TOTAL: \$157,045
Prin. Invest. NASA Tech. Officer CASE Category
Johnson, R. E. HQ-EL/Bergstralh, J. T. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NAG 5-1018 University of Virginia 6118
Forest ecoseptems dynamics
Period Obligations
10/15/87-10/14/89 FY89: TOTAL: \$134,996
Prin. Invest. NASA Tech. Officer CASE Category
Shugart, H. H. GSFC/Smith, J. A. 39-Env Sci, NEC

NAGW 764 University of Virginia 6126
Emission processes and dynamics of hot gases in astrophysics
Period Obligations
07/01/85-05/31/90 FY89: \$185,000 TOTAL: \$840,416
Prin. Invest. NASA Tech. Officer CASE Category
Chevalier, R. A. HQ-EZ/Clayton, G. C. 13-Physics
HQ-EZ/Bunner, A. N.

NAG 5-1035 University of Virginia 6119
Spectra of late type dwarf stars of known abundance for stellar population models
Period Obligations
02/01/88-05/31/90 FY89: TOTAL: \$28,299
Prin. Invest. NASA Tech. Officer CASE Category
O'Connell, R. W. GSFC/Kondo, Y. 11-Astronomy
Burstein, D.
Wu, C. C.

NAGW 929 University of Virginia 6127
Collisional dynamics of perturbed particle disks in the solar
Period Obligations
07/01/86-12/31/89 FY89: TOTAL: \$60,002
Prin. Invest. NASA Tech. Officer CASE Category
Roberts, W. W. HQ-EL/Scott, D. H. 32-Geological Sci
HQ-EL/Boyce, J. M.

NAG 5-1059 University of Virginia 6120
Contentum processes in BL lacertoe objects
Period Obligations
08/01/88-07/31/90 FY89: TOTAL: \$14,847
Prin. Invest. NASA Tech. Officer CASE Category
Balbus, S. GSFC/Kondo, Y. 11-Astronomy

NAGW 947 University of Virginia 6128
Using satellite measureable environmental parameters for extending models of ecological processes to large spatial scales
Period Obligations
08/01/86-01/31/90 FY89: TOTAL: \$94,970
Prin. Invest. NASA Tech. Officer CASE Category
Shugart, H. H. HQ-EE/Wickland, D. E. 39-Env Sci, NEC
HQ-EE/Ruzek, M.

NASA'S UNIVERSITY PROGRAM
VIRGINIA (Continued)

NAGW 1233 University of Virginia 6129
Evolution of the calcium modulated proteins synthesis and evolution of the precursor calmodulin fold
Period *Obligations*
11/01/87-02/28/90 FY89: TOTAL: \$43,415
Prin. Invest. NASA Tech. Officer CASE Category
Kretsinger, R. H. HQ-EB/Rummel, J. D. 51-Biological Sci

NAGW 1510 University of Virginia 6130
Numerical studies in high energy astrophysical gas dynamics
Period *Obligations*
12/01/88-12/31/89 FY89: \$26,887 TOTAL: \$26,887
Prin. Invest. NASA Tech. Officer CASE Category
Hawley, J. F. HQ-EZ/Kaluzienski, L. J. 11-Astronomy
Balbus, S. A. HQ-EZ/Bunner, A. N.

NAGW 1669 University of Virginia 6131
Kinetic theory of nonlinear waves in space plasmas
Period *Obligations*
04/01/89-03/28/90 FY89: \$50,000 TOTAL: \$50,000
Prin. Invest. NASA Tech. Officer CASE Category
Dorning, J. J. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Perry, T. W.

NAGW 1692 University of Virginia 6132
Intelligent processing of materials for design and manufacturing
Period *Obligations*
11/01/88-10/31/89 FY89: \$776,134 TOTAL: \$776,134
Prin. Invest. NASA Tech. Officer CASE Category
Wadley, H. N. HQ-RM/Venneri, S. L. 47-Materials Engr
Courtney, T. H. HQ-RM/Crooker, T.
Wert, J. A.

NAGW 1731 University of Virginia 6133
Modeling trace gas transports
Period *Obligations*
01/01/89-12/31/89 FY89: \$56,182 TOTAL: \$56,182
Prin. Invest. NASA Tech. Officer CASE Category
Garstang, M. HQ-EE/Dodge, J. C. 31-Atmos Sci
HQ-EE/Tuyahov, A.

NAGW 1733 University of Virginia 6134
Laboratory reflectance spectra of irradiated ices applications to Europa
Period *Obligations*
03/01/89-02/28/90 FY89: \$15,000 TOTAL: \$15,000
Prin. Invest. NASA Tech. Officer CASE Category
Boring, J. W. HQ-EL/Underwood, J. R. 32-Geological Sci

NAS 1-16550 University of Virginia 6135
Interplanetary dust experiment
Period *Obligations*
01/07/81-12/31/91 FY89: TOTAL: \$138,057
Prin. Invest. NASA Tech. Officer CASE Category
Singer, S. F. LARC/Jones, J. L. 31-Atmos Sci
Stanley, J. E.

NAS 5-28613 University of Virginia 6136
Provide Starlab meeting support
Period *Obligations*
11/16/84-10/31/87 FY89: TOTAL: \$44,571
Prin. Invest. NASA Tech. Officer CASE Category
O'connel, R. GSFC/Cyphers, H. 19-Phys Sci, NEC

NCA 2-255 University of Virginia 6137
Operator characteristics for understanding dynamical displays capacities limitations and defaults
Period *Obligations*
10/01/87-09/30/89 FY89: \$40,000 TOTAL: \$80,000
Prin. Invest. NASA Tech. Officer CASE Category
Proffitt, D. R. ARC/Kaiser, M. K. 69-Psych, NEC

NCC 1-106 University of Virginia 6138
Convective transports over then Amazon basin
Period *Obligations*
07/01/86-09/30/90 FY89: \$98,090 TOTAL: \$343,663
Prin. Invest. NASA Tech. Officer CASE Category
Garstang, M. LARC/Drewry, J. W. 31-Atmos Sci
LARC/Hoell, J. M.

NGT 00-050-002 University of Virginia 6139
NASA graduate student researchers program
Period *Obligations*
06/01/86-05/31/89 FY89: TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Galloway, J. N. HQ-XE/Owens, F. C. 39-Env Sci, NEC

NGT 00-050-102 University of Virginia 6140
NASA graduate student researchers program
Period *Obligations*
06/01/86-05/31/89 FY89: TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Shugart, H. H. HQ-LE/Owens, F. C. 39-Env Sci, NEC

NGT 00-050-105 University of Virginia 6141
NASA graduate student researchers program
Period *Obligations*
09/01/86-08/31/90 FY89: TOTAL: \$54,000
Prin. Invest. NASA Tech. Officer CASE Category
Hudson, J. L. HQ-LE/Owens, F. C. 42-Astro Engr

NGT 00-050-116 University of Virginia 6142
NASA graduate student researchers program
Period *Obligations*
06/01/87-05/31/89 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Pilkey, W. HQ-LE/Owens, F. C. 46-Mech Engr

NGT 00-050-125 University of Virginia 6143
NASA graduate student researchers program
Period *Obligations*
06/01/87-05/31/89 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Inigo, R. M. HQ-XE/Owens, F. C. 45-Elec Engr

NGT 00-050-142 University of Virginia 6144
NASA graduate student researchers program
Period *Obligations*
06/01/87-05/31/90 FY89: \$17,000 TOTAL: \$53,000
Prin. Invest. NASA Tech. Officer CASE Category
McDaniel, J. C. HQ-XE/Owens, F. C. 41-Aero Engr

NGT 00-050-183 University of Virginia 6145
NASA graduate student researchers program
Period *Obligations*
06/01/87-11/30/89 FY89: TOTAL: \$36,000
Prin. Invest. NASA Tech. Officer CASE Category
Dorning, J. J. HQ-XE/Owens, F. C. 13-Physics

**NASA'S UNIVERSITY PROGRAM
VIRGINIA (Continued)**

NGT 00-050-334	University of Virginia	6146	NAG 1-239	Virginia Commonwealth University	6155
NASA graduate student researchers program			Synthesis of thermally stable polypyrazoles, polyprimidines, and other heteroaromatic polymers		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
08/01/88-07/31/90	FY89: \$18,000	TOTAL: \$36,000	12/01/81-08/15/89	FY89:	TOTAL: \$371,251
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Lilleleht, L. U.	HQ-XE/Owens, F. C.	43-Chem Engr	Bass, R. G.	LARC/Hergenrother, P. M.	12-Chemistry
				LARC/Johnston, N. J.	
NGT 00-050-343	University of Virginia	6147	NAG 1-594	Virginia Commonwealth University	6156
NASA graduate student researchers program			Preparation of neodymium (iii) liquid lasers		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
08/01/88-07/31/89	FY89:	TOTAL: \$18,000	06/01/85-10/31/89	FY89: \$34,740	TOTAL: \$104,293
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Pilkey, W. D.	HQ-XE/Owens, F. C.	46-Mech Engr	Vallarino, L. M.	HQ-/Williams, M. D.	12-Chemistry
Haviland, J. K.				LARC/Meador, W. E.	
NGT 00-050-345	University of Virginia	6148	NAG 1-672	Virginia Commonwealth University	6157
NASA graduate student researchers program			Investigation of bis 3 4 dimethylenepyrrolidine polyarylene as high temperature reactive oligomers		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
09/01/88-12/31/89	FY89:	TOTAL: \$18,000	04/16/86-12/31/89	FY89:	TOTAL: \$122,821
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
McVey, E.	HQ-XE/Owens, F. C.	12-Chemistry	Ottenbrite, R. M.	LARC/Johnston, N. J.	12-Chemistry
				LARC/Hergenrother, P. M.	
NGT 00-070-051	University of Virginia	6149	NAG 1-695	Virginia Commonwealth University	6158
Graduate student researchers underrepresented minority focus program			Development of acoustic test apparatus for evaluation of the state of the human airways		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
09/01/87-08/31/89	FY89: \$18,000	TOTAL: \$36,000	08/16/86-08/15/90	FY89:	TOTAL: \$52,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Martin, W. N.	HQ-XE/Owens, F. C.	22-Computer Science	Patterson, J. L.	LARC/Samos, J.	56-Medical Sciences
				LARC/Seiner, J. M.	
NGT 00-070-052	University of Virginia	6150	NAGW 1178	Virginia Commonwealth University	6159
Graduate student researchers underrepresented minority focus program			Influences of weightlessness		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
09/01/87-12/31/88	FY89: \$7,130	TOTAL: \$25,130	01/01/87-12/31/89	FY89:	TOTAL: \$118,827
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Martin, W. N.	HQ-XE/Owens, F. C.	22-Computer Science	Eckberg, D. L.	HQ-EB/Sulzman, F.	56-Medical Sciences
NGT 00-070-063	University of Virginia	6151	NAGW 1528	Virginia Commonwealth University	6160
Graduate student researchers underrepresented minority focus program			Relevance of baroreflex resetting to human cardiovascular adjustments to weightlessness		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
10/01/87-09/30/89	FY89: \$18,000	TOTAL: \$36,000	01/01/89-12/31/89	FY89: \$100,000	TOTAL: \$100,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Gangloff, R. P.	HQ-XE/Owens, F. C.	99-Multi-Discip	Eckberg, D.	HQ-EB/Stoklosa, J.	56-Medical Sciences
NGT 00-070-127	University of Virginia	6152	NAS 9-16046	Virginia Commonwealth University	6161
NASA graduate student researchers underrepresented minority focus program			Influence of weightlessness upon automatic cardiovascular control		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
08/01/89-07/31/90	FY89: \$18,000	TOTAL: \$18,000	01/17/80-01/01/93	FY89: \$342,452	TOTAL: \$2,587,971
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Pilkey, W. D.	HQ-XE/Owens, F. C.	49-Engr, NEC	Exkberg, D. L.	JSC/Young, W. J.	59-Life Sci, NEC
NGT 00-070-147	University of Virginia	6153	NCC 1-87	Virginia Commonwealth University	6162
Graduate student researchers underrepresented minority focus program			Application of ultrasonic techniques in patients suffering trauma		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
07/01/89-06/30/90	FY89: \$18,000	TOTAL: \$18,000	09/01/84-04/30/88	FY89:	TOTAL: \$90,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Allaire, P. E.	HQ-XE/Owens, F. C.	47-Materials Engr	Marmarou, A.	LARC/Yost, W. T.	56-Medical Sciences
				LARC/Cantrell, J. H., Jr.	
NSG 7572	University of Virginia	6154			
Study of layered deposits and paleoclimates on Mars					
<i>Period</i>	<i>Obligations</i>				
04/01/79-10/31/89	FY89: \$16,398	TOTAL: \$266,986			
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>			
Howard, A. D.	HQ-EL/Underwood, J. R.	32-Geological Sci			
	HQ-EL/Boyce, J. M.				

**NASA'S UNIVERSITY PROGRAM
VIRGINIA (Continued)**

NAG 9-102	Virginia Military Institute	6163	NAG 1-537	Va Polytechnic Inst & St Univ	6171
Redox processes in synthetic lunar magmas			Postbuckling and crippling of graphite-epoxy channel and zee section columns		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
05/01/85-05/01/89	FY89:	TOTAL: \$59,182	11/01/84-10/31/90	FY89: \$58,000	TOTAL: \$190,106
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Schreider, H. D.	JSC/Browne, I. D.	19-Phys Sci, NEC	Johnson, E. R.	LARC/Starnes, J. H., Jr.	41-Aero Engr
NAG 1-168	Va Polytechnic Inst & St Univ	6164	NAG 1-570	Va Polytechnic Inst & St Univ	6172
Structural optimization for improved damage tolerance			Position control of flexible beams w/root actuation		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
09/01/81-12/15/89	FY89: \$100,022	TOTAL: \$561,620	02/01/85-01/10/89	FY89:	TOTAL: \$259,476
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Haftka, R. T.	LARC/Starnes Jr., J. H.	41-Aero Engr	Robertshaw, H. H.	LARC/Horner, G. C.	46-Mech Engr
NAG 1-201	Va Polytechnic Inst & St Univ	6165	NAG 1-603	Va Polytechnic Inst & St Univ	6173
Compression strength failure mechanisms in unidirectional composite laminates containing a hole			Interdisciplinary research on aeronautical and space vehicles		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
06/15/81-05/31/89	FY89:	TOTAL: \$29,809	06/20/85-03/15/90	FY89: \$36,069	TOTAL: \$231,440
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Johnson, E. R.	LARC/Starnes, J. H., Jr.	41-Aero Engr	Haftka, R. T.	LARC/Adelman, H. M.	41-Aero Engr
			Grossman, B.		
			Cliff, E. N.		
NAG 1-224	Va Polytechnic Inst & St Univ	6166	NAG 1-643	Va Polytechnic Inst & St Univ	6174
Automated sizing of aerospace structures under multiple constraints			Optimum design of geodesically stiffened composite plates		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
11/01/81-10/31/89	FY89: \$88,169	TOTAL: \$615,908	03/16/86-06/15/90	FY89: \$24,758	TOTAL: \$88,765
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Haftka, R. T.	LARC/Adelman, H. M.	41-Aero Engr	Gurdal, Z.	LARC/Starnes, J. H.	41-Aero Engr
Hallauer, W. L.				LARC/Shuart, M. J.	
NAG 1-225	Va Polytechnic Inst & St Univ	6167	NAG 1-675	Va Polytechnic Inst & St Univ	6175
Identification and control of structures in space			Development and verification of local global analysis techniques for laminated composites		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
11/01/81-01/31/90	FY89: \$61,381	TOTAL: \$388,160	06/16/86-12/15/89	FY89: \$47,663	TOTAL: \$158,152
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Meirovitch, L.	LARC/Williams, J. P.	42-Astro Engr	Griffin, O. H., Jr.	LARC/Knight, N. F., Jr.	41-Aero Engr
Barah, H.	LARC/Welch, S. L.			LARC/Stroud, W. J.	
NAG 1-300	Va Polytechnic Inst & St Univ	6168	NAG 1-714	Va Polytechnic Inst & St Univ	6176
Fundamental approach to the sticking of insect residues to aircraft wings			The effects of surface imperfections on the stability of compressible flows		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
12/16/82-05/31/88	FY89:	TOTAL: \$175,422	10/30/86-03/31/89	FY89:	TOTAL: \$128,202
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Eiss Jr., N. S.	LARC/Somers, D. M.	49-Engr, NEC	Nayfeh, A. H.	LARC/Holmes, B. J.	41-Aero Engr
Wightman, J. P.	LARC/Johnston, N. J.		Ragab, S. A.	LARC/Liu, C. H.	
NAG 1-343	Va Polytechnic Inst & St Univ	6169	NAG 1-749	Va Polytechnic Inst & St Univ	6177
NASA materials science and engineering program			The behavior of elastic anisotropic laminated composite flat structures subjected to deterministic and random loadings		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
03/01/83-12/31/89	FY89: \$628,275	TOTAL: \$5,064,532	07/01/87-06/30/90	FY89: \$52,528	TOTAL: \$151,835
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Stephenson, F. W.	LARC/Tenney, D. R.	47-Materials Engr	Librescu, L.	LARC/Stein, M.	41-Aero Engr
	LARC/Swann, R. T.				
NAG 1-390	Va Polytechnic Inst & St Univ	6170	NAG 1-754	Va Polytechnic Inst & St Univ	6178
An analytical investigation of synchrophasing as a means of aircraft interior noise control			Low angle clutter research for airborne Doppler radar simulation applications		
<i>Period</i>	<i>Obligations</i>		<i>Period</i>	<i>Obligations</i>	
09/15/83-01/14/90	FY89: \$78,429	TOTAL: \$509,475	04/01/87-04/30/88	FY89:	TOTAL: \$49,730
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Fuller, C. R.	LARC/Silcox, R. J.	41-Aero Engr	Brown, G. S.	LARC/Staton, L. D.	45-Elec Engr
	LARC/Lester, H. C.			LARC/Bracalente, E. M.	

NASA'S UNIVERSITY PROGRAM
VIRGINIA (Continued)

NAG 1-762 **Va Polytechnic Inst & St Univ** **6179**
 Application of pattern recognition techniques to the identification of
 aerospace acoustic sources
Period *Obligations*
 07/15/87-11/14/89 FY89: \$69,474 TOTAL: \$131,647
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Fuller, C. R. LARC/Chestnutt, D. 49-Engr, NEC
 O'Brien, W. F. LARC/Preisser, J. S.

NAG 1-866 **Va Polytechnic Inst & St Univ** **6187**
 Computational fluid dynamics research in three-dimensional techniques
Period *Obligations*
 03/16/88-03/15/89 FY89: TOTAL: \$40,104
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Walters, R. W. LARC/Thomas, J. L. 41-Aero Engr
 LARC/Rumsey, C. L.

NAG 1-776 **Va Polytechnic Inst & St Univ** **6180**
 Computational fluid dynamics research in hypersonic flow
Period *Obligations*
 06/01/87-11/30/89 FY89: \$164,222 TOTAL: \$387,615
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Walters, R. W. LARC/Rudy, D. H. 41-Aero Engr
 Grossman, B. LARC/Thomas, J. L.

NAG 1-873 **Va Polytechnic Inst & St Univ** **6188**
 High alpha feedback control for agile half-loop maneuvers of the F 18
 airplane
Period *Obligations*
 04/01/88-12/31/88 FY89: TOTAL: \$25,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Stallford, H. L. LARC/Arbuckle, P. D. 41-Aero Engr
 LARC/Gracey, C.

NAG 1-780 **Va Polytechnic Inst & St Univ** **6181**
 Fiber waveguide sensors for intelligent materials
Period *Obligations*
 06/05/87-06/04/88 FY89: TOTAL: \$40,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Claus, R. O. LARC/Rogowski, R. S. 45-Elec Engr
 LARC/Cantrell, J.

NAG 1-895 **Va Polytechnic Inst & St Univ** **6189**
 Optical fiber sensors and signal processing for intelligent structure
 monitoring
Period *Obligations*
 06/15/88-08/31/89 FY89: TOTAL: \$40,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Claus, R. O. LARC/Rogowski, R. S. 45-Elec Engr
 LARC/Cantrell, J. H.

NAG 1-822 **Va Polytechnic Inst & St Univ** **6182**
 Helicopter fatigue research
Period *Obligations*
 09/30/87-12/31/89 FY89: \$59,838 TOTAL: \$122,691
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Dowling, N. E. LARC/Everett, R. A. 47-Materials Engr
 LARC/Phillips, E. P.

NAG 1-901 **Va Polytechnic Inst & St Univ** **6190**
 Innovative design of composite structures
Period *Obligations*
 08/16/88-12/31/89 FY89: TOTAL: \$49,999
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Hyer, M. W. LARC/Nemeth, M. P. 41-Aero Engr

NAG 1-831 **Va Polytechnic Inst & St Univ** **6183**
 Noncontact measurement of high temperature using optical fiber
 sensors
Period *Obligations*
 11/15/87-02/28/90 FY89: \$25,000 TOTAL: \$190,967
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Claus, R. O. LARC/Brockman, P. 13-Physics
 Pieper, R. J.

NAG 1-933 **Va Polytechnic Inst & St Univ** **6191**
 Active structures for space applications
Period *Obligations*
 01/01/89-12/31/89 FY89: \$100,000 TOTAL: \$100,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Robertshaw, H. H. LARC/Horner, G. C. 46-Mech Engr
 Reinholtz, C. F.

NAG 1-840 **Va Polytechnic Inst & St Univ** **6184**
 Vibration suppression for the Cofs I mast and mini mast
Period *Obligations*
 01/15/88-04/14/89 FY89: TOTAL: \$39,512
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Lindner, D. K. LARC/Montgomery, R. C. 42-Astro Engr
 LARC/Sparks, D. W.

NAG 1-946 **Va Polytechnic Inst & St Univ** **6192**
 Advanced booster guidance studies
Period *Obligations*
 12/20/88-12/19/90 FY89: \$155,153 TOTAL: \$155,153
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Cliff, E. M. LARC/Moerder, D. D. 41-Aero Engr
 LARC/Price, D. B.

NAG 1-843 **Va Polytechnic Inst & St Univ** **6185**
 High speed mixing studies
Period *Obligations*
 01/12/88-01/11/90 FY89: \$125,000 TOTAL: \$295,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Schetz, J. A. LARC/Anders, J. B. 41-Aero Engr

NAG 1-960 **Va Polytechnic Inst & St Univ** **6193**
 Model correlation and damage location for large space truss structures
Period *Obligations*
 02/01/89-01/31/90 FY89: \$33,936 TOTAL: \$33,936
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Smith, S. W. LARC/McGowan, P. E. 42-Astro Engr
 Beattie, C. A. LARC/Cooper, P. A.

NAG 1-859 **Va Polytechnic Inst & St Univ** **6186**
 Synthesis procedure for array feeds to improve radiation performance
 of large distorted reflector antennas
Period *Obligations*
 02/25/88-05/15/90 FY89: \$81,666 TOTAL: \$141,507
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Stutzman, W. L. LARC/Bailey, M. C. 45-Elec Engr
 LARC/Campbell, T. G.

NAG 1-973 **Va Polytechnic Inst & St Univ** **6194**
 The fluid mechanics of an axisymmetric opposed flow burner
Period *Obligations*
 02/10/89-05/15/90 FY89: \$29,490 TOTAL: \$29,490
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Dancey, C. L. LARC/Pellet, G. L. 43-Chem Engr
 LARC/Northam, G. B.

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NAG 1-992 **Va Polytechnic Inst & St Univ** **6195**
Implicit algorithm development on unstructured meshes
Period *Obligations*
04/17/89-04/16/90 FY89: \$45,000 TOTAL: \$45,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Walters, R. W. LARC/Thomas, J. L. 41-Aero Engr
LARC/Anderson, W. K.

NAG 1-1006 **Va Polytechnic Inst & St Univ** **6196**
Holographic sensors for control of flexible structures
Period *Obligations*
06/07/89-06/06/90 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lindner, D. K. LARC/Welch, S. S. 42-Astro Engr
Claus, R. O.

NAG 1-1016 **Va Polytechnic Inst & St Univ** **6197**
A dynamic electrothermal model for the scanning thermistor bolometer radiometer
Period *Obligations*
06/08/89-09/07/90 FY89: \$66,510 TOTAL: \$66,510
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Mahan, J. R. LARC/Lee, R. B. 31-Atmos Sci
LARC/Keynton, R. J.

NAG 1-1030 **Va Polytechnic Inst & St Univ** **6198**
A study of failures and delamination buckling and growth in composite laminates
Period *Obligations*
10/01/89-09/30/90 FY89: \$46,212 TOTAL: \$46,212
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Reddy, J. N. LARC/Knight, N. F. 41-Aero Engr
LARC/Stroud, W. J.

NAG 1-1037 **Va Polytechnic Inst & St Univ** **6199**
High alpha forebody design part I methodology base and initial parametrics
Period *Obligations*
07/17/89-10/16/89 FY89: \$21,766 TOTAL: \$21,766
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Mason, W. H. LARC/Waggoner, E. G. 41-Aero Engr
LARC/Luckring, J. M.

NAG 1-1043 **Va Polytechnic Inst & St Univ** **6200**
Characterization of modal domain fiber optic sensors for vibration detection and suppression in flexible structures
Period *Obligations*
08/16/89-08/15/90 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Claus, R. O. LARC/Rogowski, R. S. 45-Elec Engr
Lindner, D. K.

NAG 1-1045 **Va Polytechnic Inst & St Univ** **6201**
A space marching algorithm for the parabolized Navier-Stokes equations with chemistry
Period *Obligations*
08/01/89-07/31/90 FY89: \$55,050 TOTAL: \$55,050
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Walters, R. W. LARC/Pittman, J. L. 41-Aero Engr

NAG 1-1053 **Va Polytechnic Inst & St Univ** **6202**
A comparative evaluation of in-plane shear test methods for laminated graphite-epoxy composites
Period *Obligations*
09/01/89-02/28/90 FY89: \$16,500 TOTAL: \$16,500
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Morton, J. LARC/Farley, G. L. 47-Materials Engr

NAG 2-461 **Va Polytechnic Inst & St Univ** **6203**
Design of a CAD interface for automated conceptual design of supersonic STOVL aircraft
Period *Obligations*
06/15/87-12/31/89 FY89: \$156,203 TOTAL: \$452,673
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Myklebust, R. A. ARC/Gelhausen, P. A. 41-Aero Engr
Mahan, J. R. ARC/Wilson, S. B.
Brown, E. F.

NAG 3-172 **Va Polytechnic Inst & St Univ** **6204**
Study of the stress wave factor technique for the characterization of composite materials
Period *Obligations*
04/01/81-05/29/90 FY89: \$65,545 TOTAL: \$434,037
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Henneke, E. G. LERC/Vary, A. 47-Materials Engr
Stinchcomb, W. W. LERC/Kautz, H. E.
Duke, J. C., Jr.

NAG 3-830 **Va Polytechnic Inst & St Univ** **6205**
Experimental studies of a supersonic through flow cascade
Period *Obligations*
11/06/87-11/30/90 FY89: \$30,000 TOTAL: \$219,986
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Ng, W. F. LERC/Tweedt, D. L. 41-Aero Engr
Schetz, J. A. LERC/Moore, R. D.

NAG 3-870 **Va Polytechnic Inst & St Univ** **6206**
Analysis and performance prediction of hypersonic inlets
Period *Obligations*
01/31/88-01/30/89 FY89: TOTAL: \$24,996
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Ng, W. LERC/Wood, J. R. 41-Aero Engr
LERC/Benson, T.

NAG 3-919 **Va Polytechnic Inst & St Univ** **6207**
3 D viscous flow calculation for the NASA low speed centrifugal compressor
Period *Obligations*
07/11/88-04/30/89 FY89: TOTAL: \$9,852
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Moore, J. LERC/Schumann, L. F. 41-Aero Engr
Moore, J. G.

NAG 3-933 **Va Polytechnic Inst & St Univ** **6208**
Probabilistic micromechanics for high-temperature composites
Period *Obligations*
10/01/88-09/30/90 FY89: \$55,000 TOTAL: \$130,604
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Reddy, J. N. LERC/Hopkins, D. A. 41-Aero Engr

NAG 3-1029 **Va Polytechnic Inst & St Univ** **6209**
Turbulence modelling in high-speed flows
Period *Obligations*
04/05/89-04/04/90 FY89: \$24,996 TOTAL: \$24,996
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Ng, W. LERC/Wood, J. R. 41-Aero Engr

NAG 5-636 **Va Polytechnic Inst & St Univ** **6210**
Aircraft based multibeam radar altimetry
Period *Obligations*
06/01/86-11/14/87 FY89: TOTAL: \$60,308
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Brown, G. S. GSFC/Parsons, C. L. 45-Elec Engr
GSFC/Hayne, G. S.

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NAG 5-648 **Va Polytechnic Inst & St Univ** **6211**

Analysis applied to radar sensing of the ocean surface		
<i>Period</i>	<i>Obligations</i>	
03/15/88-06/14/89	FY89:	TOTAL: \$45,807
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Brown, G. S.	GSFC/Parsons, C. L.	45-Elec Engr
	GSFC/Hayne, G. S.	

NAGW 1277 **Va Polytechnic Inst & St Univ** **6219**

Determining the effects of gravitational stresses on lignia formation and structure a new approach		
<i>Period</i>	<i>Obligations</i>	
01/01/88-12/31/89	FY89: \$50,000	TOTAL: \$100,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Lewis, N. G.	HQ-EB/Halstead, T. W.	51-Biological Sci

NAG 5-659 Va Polytechnic Inst & St Univ 6212

Multibeam radar altimeter algorithm development			
<i>Period</i>	<i>Obligations</i>		
08/01/89-07/31/90	FY89: \$21,700	TOTAL: \$21,700	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Brown, G. S.	GSFC/Parsons, C. L.	45-Elec Engr	
	GSFC/Hayne, G. S.		

NAG10-54 **Va Polytechnic Inst & St Univ** **6220**

Space Shuttle tile bond verification		
<i>Period</i>		<i>Obligations</i>
02/01/89-09/30/89	FY89: \$86,862	TOTAL: \$86,862
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Riad, S. M.	KSC/Davis, R. M.	45-Elec Engr

NAG 5-1183 Va Polytechnic Inst & St Univ 6213

Hierarchical data structures for robot collision avoidance systems			
<i>Period</i>		<i>Obligations</i>	
07/15/89-07/14/90	FY89: \$27,500	TOTAL: \$27,500	
<i>Prin. Invest</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Schaffer, C. A.	GSFC/O'Brien, M. E.	22-Computer Science	
	GSFC/Schnurr, R. G.		

NAS 1-17256 **Va Polytechnic Inst & St Univ** **6221**

A computer simulation model for managing aircraft survivability		
<i>Period</i>	<i>Obligations</i>	
12/22/82-09/30/87	FY89:	TOTAL: \$499,441
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Drew, D. R.	LARC/Sobieski, J.	49-Engr, NEC

NAG 5-1232 Va Polytechnic Inst & St Univ 6214

Analysis and design of high power digital controlled spacecraft power system			
<i>Period</i>		<i>Obligations</i>	
09/01/89-12/31/89		FY89: \$37,086	TOTAL: \$37,086
<i>Prin. Invest</i>	<i>NASA Tech. Officer</i>		<i>CASE Category</i>
Lee, F. C.	GSFC/Jagielski, J. M.		41-Aero Engr
Cho, B. H.	GSFC/Rodriguez, G. E.		

NAS 1-18106 Va Polytechnic Inst & St Univ 6222

Research effort in aerodynamics, mathematics, chemistry, physics, computer science, atmospheric science, and structural materials science		
<i>Period</i>	<i>Obligations</i>	
08/30/85-08/29/88	FY89:	TOTAL: \$573,800
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Ng. W.	LARC/Prior, E. J.	41-Aero Engr

NAG 5-1274 **Va Polytechnic Inst & St Univ** **6215**

A radio search for active galactic nuclei in the infrared astronomical satellite (IRAS) faint point source catalog			
<i>Period</i>		<i>Obligations</i>	
10/01/89-12/31/89		FY89: \$3,300	TOTAL: \$3,300
<i>Prn. Invest.</i>		<i>NASA Tech. Officer</i>	<i>Case Category</i>
Broderick, J. J.		GSFC/West, D.	11-Astronomy

NAS 1-18471 Va Polytechnic Inst & St Univ 6223

Research in aerodynamics and other related fields		
<i>Period</i>	<i>Obligations</i>	
06/15/87-06/07/92	FY89: \$837,741	TOTAL: \$1,248,836
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Unavailable	LARC/Prior: E. J.	41-Aero Engr
	LARC/Massenberg, S. E.	

NAG 5-1275 Va Polytechnic Inst & St Univ 6216

Sites of fine scale electron density turbulence in the interstellar medium		
<i>Period</i>	<i>Obligations</i>	
10/01/89-12/31/89	FY89: \$4,500	TOTAL: \$4,500
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Simonetti, J. H.	GSFC/West, D.	11-Astronomy

NAS 3-24887 Va Polytechnic Inst & St Univ 6224

Spread spectrum multiple access systems for satellite communications		
<i>Period</i>	<i>Obligations</i>	
03/13/86-04/07/89	FY89:	TOTAL: \$74,054
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Ha, T. T.	LERC/Zuzek, J. E.	49-Engr. NEC
Pratt, T.		

NAG 8-99 **Va Polytechnic Inst & St Univ** **6217**

Revitalizing the Marshall Space Flight Centers productivity improvement plan			
Period		Obligations	
01/14/88-09/13/88	FY89:		TOTAL: \$102,903
<i>Prin. Invest</i>	<i>NASA Tech. Officer</i>		<i>CASE Category</i>
Sink, D. S.	MSFC/Nabors, S. A.		99-Multi-Discip
Koelling, C. P.	MSFC/Reynolds, W. R.		

NCA 2-316 Va Polytechnic Inst & St Univ 6225

The role of submarine groundwater discharge in polar lakes to the process of varve formation in polar lake sediments		
<i>Period</i>	<i>Obligations</i>	
04/15/88-04/14/90	FY89:	TOTAL: \$9,900
<i>Prin. Invest</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Simmons, G. M.	ARC/McKay, C. P.	51-Biological Sci

NAG 8-120 Va Polytechnic Inst & St Univ 6218

Development of a strategy for revitalizing MSFC quality and productivity improvement plan and effort		
<i>Period</i>	<i>Obligations</i>	
12/12/88-12/18/89	FY89: \$87,721	TOTAL: \$87,721
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Sink, D. S.	MSFC/Nabors, S. A.	99-Multi-Discip

NCC 1-130 Va Polytechnic Inst & St Univ 6226

The response of nonlinear springs		
<i>Period</i>		<i>Obligations</i>
08/25/88-05/15/90	FY89:	TOTAL: \$59,983
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Hyer, M. W.	LARC/Farley, G. L.	41-Aero Engr

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VIRGINIA (Continued)

NCC 2-71 Va Polytechnic Inst & St Univ 6227
The accelerated characterization of polymer based fiber reinforced composites

Period	Obligations	
10/01/80-03/14/89	FY89: TOTAL: \$474,056	
Prin. Invest.	NASA Tech. Officer	CASE Category
Brinson, H. F.	ARC/Nelson, H. G.	47-Materials Engr
Hiel, C.		

NCC 2-568 Va Polytechnic Inst & St Univ 6228
Experimental verification of CFD codes for predicting recirculating jet flows

Period	Obligations	
10/01/88-05/31/90	FY89: \$40,000 TOTAL: \$40,000	
Prin. Invest.	NASA Tech. Officer	CASE Category
Mahan, J. R.	ARC/Gelhausen, P. A.	46-Mech Engr
	ARC/Wilson, S. B., III	

NGT 00-050-001 Va Polytechnic Inst & St Univ 6229
NASA graduate student researchers program

Period	Obligations	
04/01/86-09/15/89	FY89: TOTAL: \$54,000	
Prin. Invest.	NASA Tech. Officer	CASE Category
O'brien, W. F.	HQ-LE/Owens, F. C.	46-Mech Engr

NGT 00-050-004 Va Polytechnic Inst & St Univ 6230
NASA graduate student researchers program

Period	Obligations	
06/16/86-10/16/89	FY89: \$6,000 TOTAL: \$59,884	
Prin. Invest.	NASA Tech. Officer	CASE Category
Lindner, D.	HQ-XE/Owens, F. C.	45-Elec Engr

NGT 00-050-089 Va Polytechnic Inst & St Univ 6231
NASA graduate student researchers program

Period	Obligations	
06/15/86-06/14/89	FY89: TOTAL: \$54,000	
Prin. Invest.	NASA Tech. Officer	CASE Category
Ng, W. F.	HQ-LE/Owens, F. C.	46-Mech Engr

NGT 00-050-119 Va Polytechnic Inst & St Univ 6232
NASA graduate student researchers program

Period	Obligations	
06/12/87-06/11/90	FY89: \$18,000 TOTAL: \$54,000	
Prin. Invest.	NASA Tech. Officer	CASE Category
Hyer, M. W.	HQ-LE/Owens, F. C.	49-Engr, NEC

NGT 00-050-123 Va Polytechnic Inst & St Univ 6233
NASA graduate student researchers program

Period	Obligations	
06/15/87-06/14/90	FY89: TOTAL: \$36,000	
Prin. Invest.	NASA Tech. Officer	CASE Category
Telonis, D. P.	HQ-LE/Owens, F. C.	46-Mech Engr

NGT 00-050-144 Va Polytechnic Inst & St Univ 6234
NASA graduate student researchers program

Period	Obligations	
06/15/87-06/14/90	FY89: \$18,000 TOTAL: \$54,000	
Prin. Invest.	NASA Tech. Officer	CASE Category
Telonis, D. P.	HQ-XE/Owens, F. C.	46-Mech Engr

NGT 00-050-230 Va Polytechnic Inst & St Univ 6235
NASA graduate student researchers program

Period	Obligations	
06/10/87-08/31/90	FY89: \$18,000 TOTAL: \$79,052	
Prin. Invest.	NASA Tech. Officer	CASE Category
Dugger, W. E.	HQ-XE/Owens, F. C.	99-Multi-Discip

NGT 00-050-392 Va Polytechnic Inst & St Univ 6236
NASA graduate student researchers program

Period	Obligations	
08/22/88-08/21/90	FY89: \$35,600 TOTAL: \$35,600	
Prin. Invest.	NASA Tech. Officer	CASE Category
Robertshaw, H. H.	HQ-XE/Owens, F. C.	46-Mech Engr

NGT 00-050-396 Va Polytechnic Inst & St Univ 6237
Training and evaluation workshop for supplementary curriculum materials

Period	Obligations	
02/01/89-08/31/89	FY89: \$21,741 TOTAL: \$21,741	
Prin. Invest.	NASA Tech. Officer	CASE Category
Dugger, W. E.	HQ-XE/Owens, F. C.	99-Multi-Discip

NGT 00-050-404 Va Polytechnic Inst & St Univ 6238
NASA graduate student researchers program

Period	Obligations	
07/01/89-06/30/90	FY89: \$18,000 TOTAL: \$18,000	
Prin. Invest.	NASA Tech. Officer	CASE Category
Reddy, J. N.	HQ-XE/Owens, F. C.	46-Mech Engr

NGT 00-050-413 Va Polytechnic Inst & St Univ 6239
NASA graduate student researchers program

Period	Obligations	
08/16/89-08/15/90	FY89: \$18,000 TOTAL: \$18,000	
Prin. Invest.	NASA Tech. Officer	CASE Category
Stutzman, W.	HQ-XE/Owens, F. C.	45-Elec Engr

NGT 00-050-439 Va Polytechnic Inst & St Univ 6240
NASA graduate student researchers program

Period	Obligations	
07/01/89-06/30/90	FY89: \$18,000 TOTAL: \$18,000	
Prin. Invest.	NASA Tech. Officer	CASE Category
Ng, W. F.	HQ-XE/Owens, F. C.	46-Mech Engr

NGT 00-050-489 Va Polytechnic Inst & St Univ 6241
NASA graduate student researchers program

Period	Obligations	
07/01/89-06/30/90	FY89: \$18,000 TOTAL: \$18,000	
Prin. Invest.	NASA Tech. Officer	CASE Category
Laporte, J. E.	HQ-XE/Schwartz, E.	29-Math/Computer, NEC

NGT 00-070-088 Va Polytechnic Inst & St Univ 6242
Graduate student researchers underrepresented minority focus program

Period	Obligations	
08/16/88-08/15/90	FY89: \$18,000 TOTAL: \$36,000	
Prin. Invest.	NASA Tech. Officer	CASE Category
Mahan, J. R.	HQ-XE/Owens, F. C.	46-Mech Engr

NGT 47-004-810 Va Polytechnic Inst & St Univ 6243
NASA graduate student researchers program

Period	Obligations	
06/20/85-06/19/89	FY89: TOTAL: \$72,000	
Prin. Invest.	NASA Tech. Officer	CASE Category
Dugger, W. E.	HQ-LE/Owens, F. C.	11-Astronomy

NASA'S UNIVERSITY PROGRAM **VIRGINIA (Continued)**

NGT 47-004-811 **Va Polytechnic Inst & St Univ** **6244**
NASA graduate student researchers program
Period *Obligations*
01/01/86-06/30/89 FY89: TOTAL: \$43,090
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Duke, J. C., Jr. HQ-LE/Owens, F. C. 49-Engr, NEC

NAG 1-416 **Virginia State University** **6245**
Materials science research with subatomic particles
Period *Obligations*
01/01/84-02/28/90 FY89: \$101,774 TOTAL: \$860,521
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Stronach, C. E. LARC/Wilson, J. W. 19-Phys Sci, NEC
Grynszpan, R. I. LARC/Meador, W. E.
Stith, J. J.

NAG 1-743 **Virginia State University** **6246**
Measurement of thermal optical properties of solid state laser materials
Period *Obligations*
04/01/87-10/31/89 FY89: TOTAL: \$114,549
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Henderson, G. W. LARC/Brockman, P. 13-Physics
LARC/Hess, R. V.

NAG 1-765 **Virginia State University** **6247**
Computer simulation of radiation damage in semiconductors and polymers
Period *Obligations*
05/18/87-12/31/89 FY89: \$103,891 TOTAL: \$197,127
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Stith, J. J. LARC/Wilson, J. W. 19-Phys Sci, NEC
Davenport, J. C.

NGT 00-050-112 **Virginia State University** **6248**
NASA graduate student researchers program
Period *Obligations*
06/01/87-05/31/90 FY89: \$18,000 TOTAL: \$53,266
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wightman, J. P. HQ-LE/Owens, F. C. 99-Multi-Discip

NAG 1-176 **University of Washington** **6251**
Study of blackbody-pumped lasers
Period *Obligations*
04/01/81-12/31/89 FY89: \$35,000 TOTAL: \$473,639
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Christiansen, W. H. LARC/Deyoung, R. J. 13-Physics
LARC/Conway, E. J.

NAG 1-327 **University of Washington** **6252**
Research related to the technology of space energy conversion systems
Period *Obligations*
02/08/83-12/07/89 FY89: \$175,000 TOTAL: \$1,402,117
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hertzberg, A. LARC/Conway, E. J. 42-Astro Engr
Bruckner, A. P. LARC/Deyoung, R.
Mattick, A. T.

NAG 1-746 **University of Washington** **6253**
Ram cannon for a space cargo launcher
Period *Obligations*
04/01/87-10/31/88 FY89: TOTAL: \$99,933
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hertzberg, A. LARC/Martin, J. A. 41-Aero Engr
Bruckner, A. P. LARC/Freeman, D. C.

NAG 1-913 **University of Washington** **6254**
Robust integrated autopilot autothrottle design using constrained parameter optimization
Period *Obligations*
09/16/88-09/15/90 FY89: \$30,460 TOTAL: \$59,232
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Loily, U. LARC/Hueschen, R. M. 45-Elec Engr
LARC/Belcastro, C. M.

NAG 1-925 **University of Washington** **6255**
Airborne measurements of DMS SOZ and during GTE cite 3
Period *Obligations*
02/01/89-01/31/90 FY89: \$71,859 TOTAL: \$71,859
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Ferek, R. J. LARC/Barrick, J. D. 31-Atmos Sci
Hegg, D. A. LARC/Hoell, J. M.
Hobbs, P. V.

WASHINGTON

NCC 2-437 **Eastern Washington Univ** **6249**
Dynamically reconfigurable microprocessor based instrumentation systems for airborne applications
Period *Obligations*
10/01/86-10/31/89 FY89: \$148,828 TOTAL: \$427,208
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hale, A. L. ARC/Bogue, R. K. 45-Elec Engr
ARC/Bever, G. A.

NAG 1-974 **University of Washington** **6256**
The mechanical behavior of structural materials
Period *Obligations*
02/13/89-02/12/90 FY89: \$75,539 TOTAL: \$75,539
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Tuttle, M. E. LARC/Johnson, W. S. 46-Mech Engr
LARC/Crews, J. H.

NAG 1-41 **University of Washington** **6250**
Radiation viewfactor analysis
Period *Obligations*
03/01/80-12/31/89 FY89: \$62,194 TOTAL: \$416,833
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Emery, A. F. LARC/Shore, C. P. 46-Mech Engr
Kippenham, C. J. LARC/Polesky, S. P.

NAG 1-1055 **University of Washington** **6257**
Multirate digital yaw damper and modal suppression system design
Period *Obligations*
09/01/89-08/31/90 FY89: \$31,499 TOTAL: \$31,499
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Berg, M. C. LARC/Ostroff, A. J. 41-Aero Engr
LARC/Hueschen, R. M.

**NASA'S UNIVERSITY PROGRAM
WASHINGTON (Continued)**

NAG 3-376	University of Washington		6258
	Investigation of three-dimensional boundary layer flows in subsonic diffusers		
	<i>Period</i>	<i>Obligations</i>	
	12/05/82-03/19/90	FY89: \$92,962 NASA Tech. Officer Gessner, F. B. LERC/Hingst, W. R. LERC/Porro, A. R.	TOTAL: \$425,682 CASE Category 41-Aero Engr
NAG 3-871	University of Washington		6259
	Structure property relations in Al Nb based alloys		
	<i>Period</i>	<i>Obligations</i>	
	02/01/88-11/30/89	FY89: \$45,000 NASA Tech. Officer Stoebe, T. G. LERC/Titran, R. H. LERC/Nathal, M. V.	TOTAL: \$95,000 CASE Category 47-Materials Engr
NAG 3-1061	University of Washington		6260
	The aerothermodynamics of hypersonic reacting flows in the ram accelerator		
	<i>Period</i>	<i>Obligations</i>	
	07/17/89-07/16/90	FY89: \$150,000 NASA Tech. Officer Hertzberg, A. LERC/Lezberg, E. A. Bruckner, A. P.	TOTAL: \$150,000 CASE Category 41-Aero Engr
NAG 5-45	University of Washington		6261
	Observations of selected astronomical objects		
	<i>Period</i>	<i>Obligations</i>	
	04/15/80-09/14/90	FY89: \$10,900 NASA Tech. Officer Bohm, K. H. GSFC/West, D. Vitense, E. B.	TOTAL: \$139,446 CASE Category 11-Astronomy
NAG 5-357	University of Washington		6262
	Mass loss and photospheric structure in early type spectrum variables		
	<i>Period</i>	<i>Obligations</i>	
	08/01/83-09/30/90	FY89: \$34,500 NASA Tech. Officer Brown, D. GSFC/West, D. Shore, S. N. Bolton, C. T.	TOTAL: \$142,192 CASE Category 11-Astronomy
NAG 5-373	University of Washington		6263
	Study of energetic particle fluxes in and beyond the Earth's data magnetosphere		
	<i>Period</i>	<i>Obligations</i>	
	10/01/83-10/31/89	FY89: \$85,000 NASA Tech. Officer Parks, G. K. GSFC/Wales, R. O. HQ-EL/Quaide, W. L.	TOTAL: \$1,050,741 CASE Category 31-Atmos Sci
NAG 5-604	University of Washington		6264
	Middle atmospheric electric fields over thunderstorm		
	<i>Period</i>	<i>Obligations</i>	
	05/01/82-04/30/90	FY89: \$77,500 NASA Tech. Officer Holzworth, R. H. GSFC/Early, L. J. Parks, G. K. GSFC/Needleman, H. C.	TOTAL: \$562,738 CASE Category 13-Physics
NAG 5-635	University of Washington		6265
	Electrodynamics of the middle atmosphere and superpressure balloon program		
	<i>Period</i>	<i>Obligations</i>	
	05/01/86-10/31/89	FY89: \$25,387 NASA Tech. Officer Holzworth, R. H. GSFC/Early, L. J. GSFC/Pless, R. H.	TOTAL: \$160,000 CASE Category 13-Physics
NAG 5-784	University of Washington		6266
	Global investigations of tropical cloud clusters		
	<i>Period</i>	<i>Obligations</i>	
	05/01/86-12/31/89	FY89: NASA Tech. Officer Houze, R. A., Jr. Katsaros, K. B. GSFC/Lau, W. K. GSFC/Thiele, O. W.	TOTAL: \$337,711 CASE Category 31-Atmos Sci
NAG 5-886	University of Washington		6267
	Analysis of the absorption of solar radiation by clouds		
	<i>Period</i>	<i>Obligations</i>	
	03/15/87-03/14/89	FY89: NASA Tech. Officer Hobbs, P. V. GSFC/Thiele, O. W.	TOTAL: \$16,210 CASE Category 31-Atmos Sci
NAG 5-901	University of Washington		6268
	Evaluation of surface radiation and energy budget stations for life		
	<i>Period</i>	<i>Obligations</i>	
	05/01/87-01/31/90	FY89: \$60,000 NASA Tech. Officer Fritschen, L. G. GSFC/Toll, D. L. GSFC/Hall, F.	TOTAL: \$188,374 CASE Category 39-Env Sci, NEC
NAG 5-943	University of Washington		6269
	Use of passive microwave radiometry to study atmospheric water content		
	<i>Period</i>	<i>Obligations</i>	
	07/01/87-12/31/89	FY89: \$40,000 NASA Tech. Officer Katsaros, K. B. GSFC/Wang, J. R. GSFC/Shiue, J. C.	TOTAL: \$160,000 CASE Category 31-Atmos Sci
NAG 5-1020	University of Washington		6270
	Ultraviolet observations of compact high surface brightness HII regions		
	<i>Period</i>	<i>Obligations</i>	
	11/01/87-10/31/89	FY89: NASA Tech. Officer Hodge, P. W. GSFC/Kondo, Y. Lee, M. G.	TOTAL: \$47,000 CASE Category 11-Astronomy
NAG 5-1038	University of Washington		6271
	Research relative to flexure for cryocooler applications		
	<i>Period</i>	<i>Obligations</i>	
	03/15/88-05/14/90	FY89: \$52,207 NASA Tech. Officer Riggle, P. Emigh, S. G. Noble, J. E. GSFC/Castles, S.	TOTAL: \$104,116 CASE Category 47-Materials Engr
NAG 5-1150	University of Washington		6272
	High resolution observations of a selected eruptive symbiotic nova		
	<i>Period</i>	<i>Obligations</i>	
	06/15/89-06/14/90	FY89: \$12,000 NASA Tech. Officer Wallerstein, G. GSFC/West, D. K.	TOTAL: \$12,000 CASE Category 11-Astronomy

NASA'S UNIVERSITY PROGRAM **WASHINGTON (Continued)**

NAG 5-1253 University of Washington 6273
 Ultraviolet emission-line parameters on soft x-ray luminosity in quasars--an X-ray Baldwin effect?
Period *Obligations*
 09/01/89-12/31/89 FY89: \$7,500 TOTAL: \$7,500
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Margon, B. GSFC/West, D. 11-Astronomy

NAG 5-1254 University of Washington 6274
 Contribution of selected faint quasi-stellar objects to the diffuse X-ray background radiation
Period *Obligations*
 09/01/89-12/31/89 FY89: \$7,300 TOTAL: \$7,300
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Anderson, S. F. GSFC/West, D. 11-Astronomy

NAG 5-1255 University of Washington 6275
 Carbon and nitrogen abundances and mixing in stars
Period *Obligations*
 09/01/89-12/31/89 FY89: \$8,700 TOTAL: \$8,700
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Vitense, E. B. GSFC/West, D. 11-Astronomy

NAG 8-61 University of Washington 6276
 Thundercloud electrification and its dependence on environmental conditions
Period *Obligations*
 08/14/86-04/27/90 FY89: \$50,000 TOTAL: \$150,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Baker, M. B. MSFC/Christian, H. J. 31-Atmos Sci
 Holzworth, R. H. MSFC/Smith, G. T.

NAG 8-590 University of Washington 6277
 The X ray properties of infrared selected Seyfert galaxies
Period *Obligations*
 07/01/86-06/30/90 FY89: TOTAL: \$54,067
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Margon, B. MSFC/Harper, B. A. 11-Astronomy
 Anderson, S.

NAG 8-608 University of Washington 6278
 Time series analysis of cataclysmic variables
Period *Obligations*
 10/01/86-09/30/88 FY89: TOTAL: \$10,758
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Deeter, J. E. MSFC/Potter, P. Y. 11-Astronomy

NAG 8-695 University of Washington 6279
 Pulse timing studies of rotating neutron stars
Period *Obligations*
 01/01/88-12/31/89 FY89: \$65,901 TOTAL: \$144,577
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Deeter, J. E. MSFC/Harper, B. 11-Astronomy

NAG 8-696 University of Washington 6280
 Time variability studies of 5 cataclysmic variables
Period *Obligations*
 10/01/87-09/30/89 FY89: TOTAL: \$59,952
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Szkody, P. MSFC/Harper, B. A. 11-Astronomy

NAG 9-84 University of Washington 6281
 The formation of cumulate rocks
Period *Obligations*
 03/01/84-03/01/90 FY89: \$52,000 TOTAL: \$310,500
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 McCallum, I. S. JSC/Browne, I. D. 32-Geological Sci

NAG 9-243 University of Washington 6282
 Analysis of Mars meteorological data
Period *Obligations*
 06/20/87-08/01/89 FY89: TOTAL: \$110,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Tillman, J. E. JSC/Pitts, D. E. 39-Env Sci, NEC

NAGW 85 University of Washington 6283
 Geologic remote sensing
Period *Obligations*
 09/16/80-07/31/89 FY89: TOTAL: \$1,200,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Adams, J. B. HQ-EE/Tuyahov, A. J. 32-Geological Sci
 HQ-EE/Murphy, R. E.

NAGW 199 University of Washington 6284
 Interdisciplinary research and development on the effects of the nature and properties of ceramic materials
Period *Obligations*
 07/01/81-12/31/89 FY89: TOTAL: \$2,515,500
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Bradt, R. C. HQ-RM/Greenfield, M. A. 47-Materials Engr
 Bollard, R. J. HQ-RM/Venneri, S. L.

NAGW 328 University of Washington 6285
 Impact crater scaling laws
Period *Obligations*
 06/16/82-10/31/89 FY89: \$44,000 TOTAL: \$300,736
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Holsapple, K. A. HQ-EL/Underwood, J. R. 32-Geological Sci
 HQ-EL/Boyce, J. M.

NAGW 412 University of Washington 6286
 Local deformation of sea ice from SAR images
Period *Obligations*
 01/01/83-05/31/89 FY89: TOTAL: \$898,265
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Rothrock, D. A. HQ-EE/Thomas, R. T. 33-Oceanography
 Thorndike, A. S. HQ-EE/Wilson, W. S.

NAGW 471 University of Washington 6287
 Investigations of stratospheric dynamics and transport using Nimbus satellite data
Period *Obligations*
 05/15/83-10/31/89 FY89: \$173,431 TOTAL: \$963,316
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Leovy, C. B. HQ-EE/McPeters, R. D. 31-Atmos Sci
 Hartman, D. L. HQ-EE/Prather, M. J.

NAGW 662 University of Washington 6288
 Wave dynamics and transport in the stratosphere
Period *Obligations*
 12/01/84-11/30/89 FY89: \$140,736 TOTAL: \$569,006
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Holton, J. R. HQ-EE/McPeters, R. D. 31-Atmos Sci
 HQ-EE/Prather, M. J.

**NASA'S UNIVERSITY PROGRAM
WASHINGTON (Continued)**

NAGW 840 University of Washington 6289
Methane and carbon monoxide: Flux and microbial process studies in streams, rivers, and coastal marine ecosystems
Period *Obligations*
10/01/85-09/30/89 FY89: \$18,750 TOTAL: \$262,500
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lilley, M. D. HQ-EE/Kurylo, M. J. 39-Env Sci, NEC
HQ-EE/Watson, R. T.

NAGW 844 University of Washington 6290
An isotopic biogeochemical study of wetland methane and its exchange with the atmosphere
Period *Obligations*
10/01/85-12/31/89 FY89: \$101,265 TOTAL: \$662,941
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Quay, P. D. HQ-EE/Kurylo, M. J. 39-Env Sci, NEC
King, S. L. HQ-EE/Watson, R. T.
Farwell, G.

NAGW 845 University of Washington 6291
A multi-sensor remote sensing approach for measuring primary productivity from space
Period *Obligations*
12/01/85-05/30/89 FY89: TOTAL: \$223,292
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Perry, M. J. HQ-EE/Yoder, J. A. 33-Oceanography
Gautier, C. HQ-EE/Wilson, W. S.

NAGW 889 University of Washington 6292
Analysis of coastal systems of Washington using satellite remote sensing of ocean color and temperature
Period *Obligations*
04/01/86-07/31/89 FY89: TOTAL: \$283,160
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Perry, M. J. HQ-EE/Yoder, J. A. 33-Oceanography
HQ-EE/Wilson, W. S.

NAGW 945 University of Washington 6293
Weddell sea passive microwave experiment
Period *Obligations*
08/15/86-08/14/88 FY89: TOTAL: \$66,027
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Grenfell, T. HQ-EE/Jezek, K. C. 33-Oceanography
HQ-EE/Wilson, W. S.

NAGW 1007 University of Washington 6294
Chlorophyll distribution from the coastal zone color scanner and hydrography in the Northern Arabian sea
Period *Obligations*
12/01/86-11/30/89 FY89: \$90,532 TOTAL: \$281,278
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Banse, K. HQ-EE/Lewis, M. R. 33-Oceanography
HQ-EE/Wilson, W. S.

NAGW 1045 University of Washington 6295
A satellite study of polyhyas in the Arctic ocean and the sea of Okhotsk using the SSME and Seasat data sets
Period *Obligations*
02/15/87-02/14/89 FY89: TOTAL: \$156,883
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Martin, S. HQ-EE/Jezek, K. C. 33-Oceanography
HQ-EE/Wilson, W. S.

NAGW 1066 University of Washington 6296
Biogenic gas emissions and source dynamics along the Amazon river floodplain
Period *Obligations*
03/15/87-03/14/89 FY89: TOTAL: \$203,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Richey, J. E. HQ-EB/Averner, M. M. 51-Biological Sci
Devol, A. H.

NAGW 1081 University of Washington 6297
Mars volcanism and weathering
Period *Obligations*
05/01/87-04/30/90 FY89: \$25,000 TOTAL: \$75,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Adams, J. B. HQ-EL/Underwood, J. R. 32-Geological Sci
HQ-EL/Boyce, J. M.

NAGW 1133 University of Washington 6298
Precision pulse timing with large area detectors collaboration with Nagoya University
Period *Obligations*
07/01/87-12/31/88 FY89: TOTAL: \$24,657
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Deeter, J. E. HQ-EZ/Kaluzienski, L. J. 11-Astronomy

NAGW 1135 University of Washington 6299
Avis data evaluation rock weathering and geobotany
Period *Obligations*
06/01/87-05/31/88 FY89: TOTAL: \$43,471
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Adams, J. B. HQ-EE/Wickland, D. E. 32-Geological Sci
Smith, M. O. HQ-EE/Ruzek, M.
Gillespie, A. R.

NAGW 1160 University of Washington 6300
Theoretical support for the aircraft mission to the ozone hole
Period *Obligations*
08/15/87-02/14/90 FY89: TOTAL: \$53,050
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Hartmann, D. L. HQ-EE/Margitan, J. J. 31-Atmos Sci
HQ-EE/Kurylo, M. J.

NAGW 1163 University of Washington 6301
Wide binary stars as a probe of dark galactic matter
Period *Obligations*
08/15/87-08/14/90 FY89: \$29,800 TOTAL: \$56,819
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Margon, B. HQ-EZ/Clayton, G. 11-Astronomy

NAGW 1218 University of Washington 6302
AMPTE IRM VLF stepped frequency receiver analysis
Period *Obligations*
09/15/87-09/14/89 FY89: \$30,000 TOTAL: \$60,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Holzworth, R. H. HQ-ES/Mellott, M. M. 13-Physics
Merrill, R. T. HQ-ES/Perry, T. W.

NAGW 1243 University of Washington 6303
Analysis of observed sea ice motion in support of remote sensing of sea ice
Period *Obligations*
12/01/87-11/30/88 FY89: TOTAL: \$73,601
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Colony, R. L. HQ-EE/Jezek, K. C. 33-Oceanography
HQ-EE/Wilson, W. S.

**NASA'S UNIVERSITY PROGRAM
WASHINGTON (Continued)**

NAGW 1256 University of Washington 6304
Sea ice type discrimination using polarimetric synthetic aperture radar
Period Obligations
01/01/88-12/31/89 FY89: \$75,315 TOTAL: \$141,519
Prin. Invest. NASA Tech. Officer CASE Category
Winebrenner, D. P. HQ-EE/Thomas, R. H. 33-Oceanography
HQ-EE/Wilson, W. S.

NAGW 1317 University of Washington 6305
Regional patterns of soil formation and paleomagnetic inferences
Period Obligations
05/01/88-12/31/89 FY89: \$250,000 TOTAL: \$417,000
Prin. Invest. NASA Tech. Officer CASE Category
Gillespie, A. R. HQ-EE/Baltuck, M. 32-Geological Sci
HQ-EE/Murphy, R. E.

NAGW 1319 University of Washington 6306
Rock weathering and geobotany
Period Obligations
04/01/88-12/31/89 FY89: \$149,955 TOTAL: \$329,954
Prin. Invest. NASA Tech. Officer CASE Category
Adams, J. B. HQ-EE/Baltuck, M. 32-Geological Sci
HQ-EE/Ruzek, M. J.

NAGW 1322 University of Washington 6307
Relationships between wind waves and radar backscatter
Period Obligations
05/01/88-04/30/90 FY89: \$42,385 TOTAL: \$97,457
Prin. Invest. NASA Tech. Officer CASE Category
Katsaros, K. B. HQ-EE/Lagerloef, G. S. 33-Oceanography
HQ-EE/Wilson, W. S.

NAGW 1341 University of Washington 6308
Martian global dust storm initiation and atmospheric oscillations
Period Obligations
06/01/88-11/30/89 FY89: \$99,999 TOTAL: \$149,994
Prin. Invest. NASA Tech. Officer CASE Category
Tillman, J. E. HQ-EL/Bergstralh, J. T. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NAGW 1394 University of Washington 6309
The role of extracellular calcium in plant gravitropism
Period Obligations
08/01/88-07/31/90 FY89: \$70,000 TOTAL: \$130,000
Prin. Invest. NASA Tech. Officer CASE Category
Cleland, R. E. HQ-EB/Halstead, T. W. 51-Biological Sci

NAGW 1436 University of Washington 6310
Satellite studies of ice edge and polynya processes
Period Obligations
01/01/89-12/31/89 FY89: TOTAL: \$86,376
Prin. Invest. NASA Tech. Officer CASE Category
Martin, S. HQ-EE/Thomas, R. H. 33-Oceanography
HQ-EE/Wilson, W. S.

NAGW 1517 University of Washington 6311
High energy galactic electron data
Period Obligations
01/01/89-12/31/89 FY89: \$55,087 TOTAL: \$55,087
Prin. Invest. NASA Tech. Officer CASE Category
Lord, J. J. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Jones, W. V.

NAGW 1605 University of Washington 6312
Zonally averaged model of dynamics radiation for the atmosphere
Period Obligations
12/01/88-11/30/89 FY89: \$78,000 TOTAL: \$78,000
Prin. Invest. NASA Tech. Officer CASE Category
Tung, K. K. HQ-EE/McPeters, R. D. 31-Atmos Sci
HQ-EE/Prather, M. J.

NAGW 1688 University of Washington 6313
Evaluation of cloud water rain rate and wind estimates made from microwave data and from numerical models
Period Obligations
11/01/88-10/31/89 FY89: \$121,156 TOTAL: \$121,156
Prin. Invest. NASA Tech. Officer CASE Category
Katsaros, K. B. HQ-EE/Dodge, J. C. 31-Atmos Sci
HQ-EE/Theon, J. S.

NAGW 1702 University of Washington 6314
Theory and applications of discrete scatterer models to microwave remote sensing
Period Obligations
01/01/89-12/31/89 FY89: \$44,292 TOTAL: \$44,292
Prin. Invest. NASA Tech. Officer CASE Category
Tsang, L. HQ-EE/Asrar, G. 13-Physics
HQ-EE/Ruzek, M.

NAGW 1723 University of Washington 6315
AMPTE IRM VLF stripped frequency receiver analysis
Period Obligations
06/01/89-05/31/90 FY89: \$50,363 TOTAL: \$50,363
Prin. Invest. NASA Tech. Officer CASE Category
Holzworth, R. H. HQ-ES/Mellott, M. M. 13-Physics
HQ-ES/Perry, T. W.

NAGW 1734 University of Washington 6316
Optical properties of CO₂ ice and CO₂ snow in the visible and infrared
Period Obligations
06/01/89-02/28/90 FY89: \$23,158 TOTAL: \$23,158
Prin. Invest. NASA Tech. Officer CASE Category
Warren, S. G. HQ-EL/Underwood, J. R. 32-Geological Sci

NAGW 1770 University of Washington 6317
Mesoscale storms fronts study with satellite winds
Period Obligations
06/01/89-05/31/90 FY89: \$73,564 TOTAL: \$73,564
Prin. Invest. NASA Tech. Officer CASE Category
Brown, R. A. HQ-EE/Dodge, J. C. 31-Atmos Sci
HQ-EE/Theon, J.

NAS 1-18157 University of Washington 6318
Science support for the Earth radiation budget experiment (ERBE)
Period Obligations
10/15/85-10/14/90 FY89: \$375,000 TOTAL: \$864,000
Prin. Invest. NASA Tech. Officer CASE Category
Hartmann, D. L. LARC/Cooper, J. E. 31-Atmos Sci
LARC/Barkstrom, B.

NAS 5-26301 University of Washington 6319
Wave dynamics and transport in the middle atmosphere (UARS)
Period Obligations
10/01/80-02/28/90 FY89: TOTAL: \$321,354
Prin. Invest. NASA Tech. Officer CASE Category
Holton, J. R. GSFC/Reber, C. 31-Atmos Sci

**NASA'S UNIVERSITY PROGRAM
WASHINGTON (Continued)**

NAS 5-26850	University of Washington	6320	
Fast and versatile 3-D plasma experiment to study magnetospheric dynamics			
<i>Period</i>	<i>Obligations</i>		
05/04/82-06/30/89	FY89:	TOTAL: \$268,840	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Parks, G. K.	GSFC/O'Brien, J. J.	13-Physics	
NAS 5-30613	University of Washington	6321	
Definition phase effort for the cluster plasma spectrometry			
<i>Period</i>	<i>Obligations</i>		
02/21/89-12/31/89	FY89: \$138,056	TOTAL: \$138,056	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Parks, G. K.	GSFC/Stich, K.	13-Physics	
NASW 4016	University of Washington	6322	
Rock weathering and geobotany			
<i>Period</i>	<i>Obligations</i>		
04/01/85-06/30/88	FY89:	TOTAL: \$704,670	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Adams, J. B.	HQ-EE/Evans, D.	32-Geological Sci	
NCA 2-185	University of Washington	6323	
Analysis of numerical methods for chemically reacting hypersonic flows			
<i>Period</i>	<i>Obligations</i>		
12/01/86-01/31/89	FY89:	TOTAL: \$60,984	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Leveque, R. J.	ARC/Yee, H. C.	21-Mathematics	
NCA 2-278	University of Washington	6324	
SIRTF pointing control system			
<i>Period</i>	<i>Obligations</i>		
01/01/88-03/31/89	FY89:	TOTAL: \$15,257	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Alexandro, F. J.	ARC/Hirata, J. H.	45-Elec Engr	
NCA 2-296	University of Washington	6325	
Surface pressure mapping by luminescence quenching			
<i>Period</i>	<i>Obligations</i>		
03/16/88-09/30/89	FY89: \$9,000	TOTAL: \$29,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Gouterman, M.	ARC/McLachlan, B. G.	12-Chemistry	
Callis, J. B.			
NCA 2-299	University of Washington	6326	
Effects of altitude on the retrieval of information from memory at Mount Everest			
<i>Period</i>	<i>Obligations</i>		
04/01/88-03/31/89	FY89:	TOTAL: \$28,877	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Nelson, T. O.	ARC/Nagel, D. C.	69-Psych, NEC	
	ARC/Foushee, H. C.		
NCA 2-429	University of Washington	6327	
The effects of emissions from the oceans on marine clouds and climate			
<i>Period</i>	<i>Obligations</i>		
07/01/89-06/30/91	FY89: \$10,000	TOTAL: \$10,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hobbs, P. V.	ARC/Toon, B.	31-Atmos Sci	
NCC 2-576	University of Washington	6328	
Spar view on the mac			
<i>Period</i>	<i>Obligations</i>		
11/01/88-10/31/89	FY89: \$14,958	TOTAL: \$14,958	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Emery, A. F.	ARC/Gong, L.	41-Aero Engr	
	ARC/Quinn, R. D.		
NGT 00-050-023	University of Washington	6329	
NASA graduate student researchers program			
<i>Period</i>	<i>Obligations</i>		
09/15/86-09/14/88	FY89:	TOTAL: \$34,768	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Parks, G. K.	HQ-LE/Owens, F. C.	13-Physics	
NGT 00-050-231	University of Washington	6330	
NASA graduate student researchers program			
<i>Period</i>	<i>Obligations</i>		
07/01/87-06/30/90	FY89: \$17,500	TOTAL: \$53,054	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Leovy, C. B.	HQ-XE/Owens, F. C.	31-Atmos Sci	
NGT 00-050-283	University of Washington	6331	
NASA graduate student researchers program			
<i>Period</i>	<i>Obligations</i>		
09/16/88-09/15/90	FY89: \$18,000	TOTAL: \$36,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Massey, R. D.	HQ-ES/Ahluwalia, H. S.	13-Physics	
Parks, G. K.	HQ-ES/Parks, G.		
NGT 00-050-322	University of Washington	6332	
NASA graduate student researchers program			
<i>Period</i>	<i>Obligations</i>		
08/30/88-08/29/90	FY89: \$18,000	TOTAL: \$34,972	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Martin, S.	HQ-XE/Owens, F. C.	33-Oceanography	
NGT 00-050-391	University of Washington	6333	
NASA graduate student researchers program			
<i>Period</i>	<i>Obligations</i>		
09/01/88-08/31/90	FY89: \$18,000	TOTAL: \$18,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Riser, S. C.	HQ-XE/Owens, F. C.	33-Oceanography	
NGT 00-050-443	University of Washington	6334	
NASA graduate student researchers program			
<i>Period</i>	<i>Obligations</i>		
07/15/89-07/14/90	FY89: \$18,000	TOTAL: \$18,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Hobbs, P. V.	HQ-XE/Owens, F. C.	13-Physics	
NGT 00-070-006	University of Washington	6335	
NASA graduate student researchers underrepresented minority focus program			
<i>Period</i>	<i>Obligations</i>		
06/15/87-06/14/90	FY89: \$18,000	TOTAL: \$51,600	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Vitense, E. B.	HQ-LE/Owens, F. C.	11-Astronomy	
NGT 00-070-050	University of Washington	6336	
Graduate student researchers underrepresented minority focus program			
<i>Period</i>	<i>Obligations</i>		
09/16/87-09/15/90	FY89:	TOTAL: \$36,000	
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>	
Margon, B.	HQ-XE/Owens, F. C.	11-Astronomy	

**NASA'S UNIVERSITY PROGRAM
WASHINGTON (Continued)**

NSG 5395 University of Washington 6337
Ultraviolet observations of selected cataclysmic variables
Period Obligations
07/01/79-02/14/90 FY89: \$8,678 TOTAL: \$233,982
Prin. Invest. NASA Tech. Officer CASE Category
Szkody, P. GSFC/Kondo, Y. 11-Astronomy

NSG 5398 University of Washington 6338
Observations of classical stellar chromospheres
Period Obligations
07/15/79-09/30/90 FY89: \$24,000 TOTAL: \$497,902
Prin. Invest. NASA Tech. Officer CASE Category
Bohm-vitense, E. GSFC/West, D. 11-Astronomy
Boggs, D.

NSG 7085 University of Washington 6339
Dynamics of planetary atmospheres
Period Obligations
07/01/74-03/31/90 FY89: \$15,190 TOTAL: \$647,681
Prin. Invest. NASA Tech. Officer CASE Category
Leovy, C. B. HQ-EL/Bergstrahl, J. T. 31-Atmos Sci
HQ-EL/Quaide, W. L.

NSG 7173 University of Washington 6340
Application of spectral reflectance of lunar samples to telescopic spectra of unvisited parts of the Moon
Period Obligations
07/01/75-10/31/89 FY89: \$39,200 TOTAL: \$730,180
Prin. Invest. NASA Tech. Officer CASE Category
Adams, J. B. HQ-EL/Underwood, J. 32-Geological Sci
HQ-EL/Boyce, J. M.

NSG 9052 University of Washington 6341
A study of interplanetary dust
Period Obligations
03/01/77-02/01/90 FY89: \$161,846 TOTAL: \$1,667,864
Prin. Invest. NASA Tech. Officer CASE Category
Brownlee, D. E. JSC/Brown, I. D. 31-Atmos Sci

NAG 1-797 Washington State University 6342
Photo nuclear absorption cross sections
Period Obligations
10/01/87-08/15/89 FY89: \$16,808 TOTAL: \$22,016
Prin. Invest. NASA Tech. Officer CASE Category
Norbury, J. W. LARC/Townsend, L. W. 13-Physics
LARC/Conway, E. J.

NAG 5-1075 Washington State University 6343
Winds from planetary nebula nuclei
Period Obligations
10/01/88-03/31/90 FY89: TOTAL: \$6,106
Prin. Invest. NASA Tech. Officer CASE Category
Lutz, J. GSFC/Kondo, Y. 11-Astronomy

NAG 9-226 Washington State University 6344
Differential pharmacokinetics and toxicology of iodine and iodide
Period Obligations
05/16/87-12/15/89 FY89: \$80,000 TOTAL: \$195,000
Prin. Invest. NASA Tech. Officer CASE Category
Bull, R. J. JSC/Sauer, R. L. 56-Medical Sciences

NAG 9-363 Washington State University 6345
Adaptive response to electrical muscle simulation during inactivity
Period Obligations
07/01/89-07/01/90 FY89: \$133,650 TOTAL: \$133,650
Prin. Invest. NASA Tech. Officer CASE Category
Gollnick, P. D. JSC/Schneider, V. 56-Medical Sciences

NAG10-32 Washington State University 6346
Calcium messenger system in gravitropic response in plants
Period Obligations
07/30/86-06/30/89 FY89: TOTAL: \$130,000
Prin. Invest. NASA Tech. Officer CASE Category
Poovaiah, B. W. KSC/Knott, W. M. 55-Agriculture Sci

NAG10-61 Washington State University 6347
Calcium messenger system in gravitropic response in plants
Period Obligations
07/01/89-06/30/90 FY89: \$45,000 TOTAL: \$45,000
Prin. Invest. NASA Tech. Officer CASE Category
Poovaiah, B. W. KSC/Knott, W. 13-Physics

NAS 5-28758 Washington State University 6348
Spectral characteristics and the extent of the palaise formation
Period Obligations
08/06/85-10/06/88 FY89: TOTAL: \$85,477
Prin. Invest. NASA Tech. Officer CASE Category
Frazier, B. E. GSFC/Oseroff, H. 39-Env Sci, NEC
Busacca, A.

NCA 2-216 Washington State University 6349
Modelling a microburst with multiple vortex rings
Period Obligations
05/16/87-09/30/89 FY89: \$11,448 TOTAL: \$49,265
Prin. Invest. NASA Tech. Officer CASE Category
Grantham, W. J. ARC/Bach, R. E. 41-Aero Engr

NGT 00-050-075 Washington State University 6350
NASA graduate student researchers program
Period Obligations
08/01/86-07/31/89 FY89: TOTAL: \$53,000
Prin. Invest. NASA Tech. Officer CASE Category
Hower, G. HQ-LE/Owens, F. C. 45-Elec Engr

NGT 00-050-481 Washington State University 6351
NASA graduate student researchers program
Period Obligations
08/16/89-08/15/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. NASA Tech. Officer CASE Category
Chung, J. N. HQ-XE/Owens, F. C. 46-Mech Engr

WEST VIRGINIA

NAG 5-1267 West Virginia State College 6352
Magnetic measurements of the Earth-ionosphere cavity resonances
Period Obligations
10/01/89-11/30/89 FY89: \$25,000 TOTAL: \$25,000
Prin. Invest. NASA Tech. Officer CASE Category
Spaniol, C. GSFC/Sutton, J. F. 19-Phys Sci, NEC

NASA'S UNIVERSITY PROGRAM **WEST VIRGINIA (Continued)**

NAG 1-625 West Virginia University 6353
Theoretical/numerical study of feasibility of use of winelets on low aspect ratio wings at subsonic + transonic Mach numbers to reduce drag
Period *Obligations*
01/06/86-05/31/89 FY89: TOTAL: \$129,718
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Kuhlman, J. M. LARC/Campbell, R. L. 41-Aero Engr
LARC/Putnam, L. E.

NAG 1-741 West Virginia University 6354
New approximations to solutions in problems of wave propagation with multi turning points
Period *Obligations*
05/16/87-05/15/90 FY89: \$43,764 TOTAL: \$126,817
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Gingold, H. LARC/Zorumski, W. E. 21-Mathematics
LARC/McAninch, G. L.

NAG 1-748 West Virginia University 6355
Comparison of two and three component laser Doppler velocimeter measurements in a subsonic jet
Period *Obligations*
05/01/87-09/30/88 FY89: TOTAL: \$10,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Kuhlman, J. M. LARC/Paulson, J. W., Jr. 41-Aero Engr

NAG 1-951 West Virginia University 6356
Winglets on low aspect ratio wings at supersonic speeds
Period *Obligations*
02/01/89-01/31/90 FY89: \$56,469 TOTAL: \$56,469
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Kuhlman, J. M. LARC/Wood, R. M. 41-Aero Engr
LARC/Bauer, S. X.

NAG 2-590 West Virginia University 6357
Muscle injury and repair in zero gravity-Cosmos 89
Period *Obligations*
06/01/89-10/31/89 FY89: \$15,000 TOTAL: \$15,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Stauber, W. T. ARC/Grindeland, R. E. 56-Medical Sciences

NAG 3-1005 West Virginia University 6358
Acoustic forcing of a liquid drop
Period *Obligations*
02/06/89-02/05/90 FY89: \$40,494 TOTAL: \$40,494
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lyell, M. J. LERC/Chai, A. T. 19-Phys Sci, NEC

NAGW 842 West Virginia University 6359
Methane processes in wetlands and forest soils: Production, decomposition, and emission
Period *Obligations*
10/01/85-06/30/89 FY89: \$50,589 TOTAL: \$387,758
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lang, G. E. HQ-EE/Kurylo, M. K. 39-Env Sci, NEC
HQ-EE/Watson, R. T.

NGT 00-070-143 West Virginia University 6360
NASA graduate student researchers underrepresented minority focus program
Period *Obligations*
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Dwivedi, S. N. HQ-XE/Owens, F. C. 55-Agriculture Sci

NGT 00-070-144 West Virginia University 6361
NASA graduate student researchers underrepresented minority focus program
Period *Obligations*
07/01/89-06/30/90 FY89: \$18,000 TOTAL: \$18,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Dwivedi, S. N. HQ-XE/Owens, F. C. 46-Mech Engr

NGT 49-001-802 West Virginia University 6362
NASA graduate student researchers program
Period *Obligations*
07/01/85-06/30/89 FY89: TOTAL: \$66,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Sivaneri, N. HQ-LE/Owens, F. C. 41-Aero Engr

WISCONSIN

NAS 5-29252 Beloit College 6363
Guaranteed time observation (GTO) program
Period *Obligations*
11/25/85-05/31/90 FY89: \$24,000 TOTAL: \$98,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Schroeder, D. J. GSFC/Kalinowski, J. K. 41-Aero Engr

NAS 8-32901 Beloit College 6364
Scientific investigations in support of the space telescope project
Period *Obligations*
02/22/78-09/30/89 FY89: TOTAL: \$283,087
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Schroeder, D. J. MSFC/Taylor, W. E. 11-Astronomy

NAG 2-212 Marquette University 6365
Alterations in skeletal muscle with disuse atrophy
Period *Obligations*
11/01/82-11/30/89 FY89: \$57,000 TOTAL: \$395,970
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Fitts, R. H. ARC/Grindeland, R. E. 51-Biological Sci
Unsworth, B. R.
Courtright, J. B.

NAG 2-460 Medical College of Wisconsin 6366
Investigation of nerve and muscle breakdown during spaceflight
Period *Obligations*
05/15/87-10/31/89 FY89: \$33,000 TOTAL: \$112,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Riley, D. A. ARC/Grindeland, R. E. 56-Medical Sciences

NAG 2-552 Medical College of Wisconsin 6367
Electron microscopy electromyography histo chemistry of rat hindlimb muscles
Period *Obligations*
10/01/88-10/31/89 FY89: \$160,000 TOTAL: \$160,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Riley, D. A. ARC/Winget, C. M. 51-Biological Sci

NAS 2-11305 Medical College of Wisconsin 6368
Electron microscopy, electromyography and protease activity of rat hind limb muscles
Period *Obligations*
08/02/82-09/30/88 FY89: TOTAL: \$779,047
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Riley, D. A. ARC/Ferandin, J. A. 51-Biological Sci
ARC/Chee, O.

**NASA'S UNIVERSITY PROGRAM
WISCONSIN (Continued)**

NAG 3-710 St. Norbert College 6369
Synthesis of diamines for polyimides
Period Obligations
09/01/86-10/14/89 FY89: \$13,500 TOTAL: \$37,500
Prin. Invest. NASA Tech. Officer CASE Category
Klopotek, D. L. LARC/Delvigs, P. 12-Chemistry

NAG 1-553 University of Wisconsin - Madison 6370
Continental middle and high cloud project for fire
Period Obligations
01/01/85-01/31/89 FY89: \$62,000 TOTAL: \$255,630
Prin. Invest. NASA Tech. Officer CASE Category
Suomi, V. E. LARC/McDougal, D. S. 31-Atmos Sci
Wylie, D. P. LARC/Owens, T. L.

NAG 1-882 University of Wisconsin - Madison 6371
Analyze high spectral resolution lidar data acquired during the FIRE CIRRUS experiment
Period Obligations
05/04/88-05/03/90 FY89: \$60,000 TOTAL: \$80,000
Prin. Invest. NASA Tech. Officer CASE Category
Eloranta, E. W. LARC/McDougal, D. S. 31-Atmos Sci
LARC/Wagner, H. S.

NAG 1-1015 University of Wisconsin - Madison 6372
Analysis of cirrus optical properties with data from the NASA ERZ high resolution interferometer spectrometer
Period Obligations
07/05/89-07/04/90 FY89: \$25,000 TOTAL: \$25,000
Prin. Invest. NASA Tech. Officer CASE Category
Smith, W. L. LARC/McDougal, D. S. 31-Atmos Sci
Ackerman, S. A. LARC/Owens, T. L.

NAG 2-265 University of Wisconsin - Madison 6373
Dynamical behavior of the polarization features on Venus from the orbiter cloud photopolarimeter OCPP data
Period Obligations
10/01/83-03/31/89 FY89: TOTAL: \$136,662
Prin. Invest. NASA Tech. Officer CASE Category
Limaye, S. ARC/Craig, R. A. 11-Astronomy
ARC/Fimmel, R. O.

NAG 2-266 University of Wisconsin - Madison 6374
Diagnostic modeling of meridional circulation on Venus
Period Obligations
10/01/83-06/30/90 FY89: TOTAL: \$79,896
Prin. Invest. NASA Tech. Officer CASE Category
Revercomb, H. ARC/Craig, R. A. 11-Astronomy
ARC/Fimmel, R. O.

NAG 2-358 University of Wisconsin - Madison 6375
He II fluid dynamics studies for spaceborne cryogenic systems
Period Obligations
07/01/85-12/31/88 FY89: TOTAL: \$300,000
Prin. Invest. NASA Tech. Officer CASE Category
Vansciver, S. W. ARC/Kittel, P. 46-Mech Engr
Walstrom, P. L. ARC/Mansfield, J. A.

NAG 2-568 University of Wisconsin - Madison 6376
Soft dense fibrous connective tissue response to hindlimb suspension
Period Obligations
04/01/89-09/30/90 FY89: \$30,299 TOTAL: \$30,299
Prin. Invest. NASA Tech. Officer CASE Category
Vailas, A. C. ARC/Grindeland, R. E. 56-Medical Sciences

NAG 2-583 University of Wisconsin - Madison 6377
An experimental x.400/x500 network
Period Obligations
07/01/89-06/30/90 FY89: \$95,206 TOTAL: \$95,206
Prin. Invest. NASA Tech. Officer CASE Category
Landweber, L. H. ARC/Jones, W. P. 22-Computer Science

NAG 3-718 University of Wisconsin - Madison 6378
Design and evaluation of an apparatus for experiments on the vaporization of fuel droplets in a super critical environment at microgravity conditions
Period Obligations
04/15/86-01/04/90 FY89: TOTAL: \$483,600
Prin. Invest. NASA Tech. Officer CASE Category
Farrell, P. V. LERC/Stockner, D. P. 49-Engr, NEC
Borman, G.
Foster, D. E.

NAG 3-786 University of Wisconsin - Madison 6379
Design and test of bidirectional speed and torque control of induction machines operating from a high frequency link converter
Period Obligations
03/05/87-03/03/89 FY89: TOTAL: \$145,000
Prin. Invest. NASA Tech. Officer CASE Category
Lipo, T. A. LERC/Sundberg, G. R. 45-Elec Engr
Sul, S. K.

NAG 3-804 University of Wisconsin - Madison 6380
High power converter topologies for space applications
Period Obligations
07/01/87-06/30/90 FY89: \$69,140 TOTAL: \$195,550
Prin. Invest. NASA Tech. Officer CASE Category
Divan, D. M. LERC/Myers, I. T. 45-Elec Engr
LERC/Baumann, E. D.

NAG 3-940 University of Wisconsin - Madison 6381
Modelling of ac and induction motors operating from electronic power converters
Period Obligations
10/01/88-09/30/90 FY89: \$36,000 TOTAL: \$109,000
Prin. Invest. NASA Tech. Officer CASE Category
Lipo, T. A. LERC/Burrows, L. M. 45-Elec Engr
Novotny, D. W.

NAG 3-1041 University of Wisconsin - Madison 6382
Magnetic bearings with high temperature superconductors
Period Obligations
05/01/89-04/30/92 FY89: \$60,000 TOTAL: \$60,000
Prin. Invest. NASA Tech. Officer CASE Category
Boom, R. W. LERC/Brown, G. V. 46-Mech Engr

NAG 5-23 University of Wisconsin - Madison 6383
Analysis of three-dimensional thunderstorm model output in terms of geosynchronous satellite observations
Period Obligations
03/01/80-12/31/89 FY89: TOTAL: \$267,743
Prin. Invest. NASA Tech. Officer CASE Category
Schlesinger, R. E. GSFC/Adler, R. F. 31-Atmos Sci

NAG 5-81 University of Wisconsin - Madison 6384
Resolution studies and energy diagnostics of global data and climate model simulations
Period Obligations
06/15/80-11/30/89 FY89: \$141,000 TOTAL: \$881,880
Prin. Invest. NASA Tech. Officer CASE Category
Johnson, D. R. GSFC/Atlas, R. M. 31-Atmos Sci

**NASA'S UNIVERSITY PROGRAM
WISCONSIN (Continued)**

NAG 5-186 University of Wisconsin - Madison 6385
Ultraviolet studies with satellite data
Period *Obligations*
06/15/81-08/31/90 FY89: \$43,880 TOTAL: \$544,246
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Savage, B. D. GSFC/West, D. 11-Astronomy
Danly, L.
Massa, D. L.

NAG 5-316 University of Wisconsin - Madison 6386
New mathematical methods for variational objective analysis of meteorological information
Period *Obligations*
05/01/83-11/30/89 FY89: \$83,000 TOTAL: \$597,170
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Wahba, G. GSFC/Pfaendtner, J. 31-Atmos Sci
Johnson, R.

NAG 5-385 University of Wisconsin - Madison 6387
Research relative to the use of available potential energy to evaluate global data sets
Period *Obligations*
01/01/84-12/31/89 FY89: \$54,999 TOTAL: \$258,088
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Horn, L. H. GSFC/Atlas, R. M. 31-Atmos Sci
Whittaker, L. M.

NAG 5-580 University of Wisconsin - Madison 6388
Determine precipitation rates from visible and infrared satellite images of clouds
Period *Obligations*
07/01/85-11/30/89 FY89: TOTAL: \$199,400
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Weinman, J. A. GSFC/Cahalan, R. 31-Atmos Sci
Chin, R. T.

NAG 5-594 University of Wisconsin - Madison 6389
Investigation of single photon calorimeters for X ray spectroscopy
Period *Obligations*
08/01/85-09/30/90 FY89: \$50,000 TOTAL: \$669,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
McCammon, D. GSFC/Glasser, C. A. 13-Physics
Guckel, H.
Juda, M.

NAG 5-629 University of Wisconsin - Madison 6390
Cosmic X-ray physics
Period *Obligations*
01/01/85-11/30/89 FY89: \$270,000 TOTAL: \$1,240,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
McCammon, D. GSFC/Early, L. J. 13-Physics
Cox, D. P. GSFC/Pless, R. H.
Kraushaar, W. L.

NAG 5-647 University of Wisconsin - Madison 6391
Development and flight of wide field imaging survey polarimeter wisp
Period *Obligations*
03/01/88-10/31/89 FY89: TOTAL: \$270,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Nordsieck, K. H. GSFC/Early, L. J. 13-Physics
GSFC/Pless, R. H.

NAG 5-745 University of Wisconsin - Madison 6392
Improved hydroxy radical measurements
Period *Obligations*
03/15/86-02/28/90 FY89: TOTAL: \$36,950
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Roesler, F. L. GSFC/Heaps, W. S. 31-Atmos Sci

NAG 5-832 University of Wisconsin - Madison 6393
The fundamental characteristics of interstellar matter
Period *Obligations*
08/15/86-08/31/90 FY89: TOTAL: \$36,200
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Cardelli, J. A. GSFC/Kondo, Y. 11-Astronomy
Brugel, E. W.

NAG 5-854 University of Wisconsin - Madison 6394
Surface energy balance
Period *Obligations*
10/01/86-08/31/89 FY89: TOTAL: \$176,461
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Diak, G. R. GSFC/Oseroff, H. 19-Phys Sci, NEC

NAG 5-902 University of Wisconsin - Madison 6395
Lidar measurements of boundary layer aerosol scattering and clouds during project fife
Period *Obligations*
05/01/87-01/31/90 FY89: \$125,000 TOTAL: \$247,347
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Eloranta, E. W. GSFC/Wetzel, P. J. 39-Env Sci, NEC
GSFC/Hall, F.

NAG 5-1031 University of Wisconsin - Madison 6396
He II fluid acquisition with applications to liquid helium fluid management in space
Period *Obligations*
01/15/88-10/31/89 FY89: TOTAL: \$100,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Van Sciver, S. W. GSFC/Dipirro, M. J. 13-Physics
GSFC/Castles, S. H.

NAG 5-1048 University of Wisconsin - Madison 6397
The measurement of atomic transition probabilities of metal atoms and ions of astrophysical interest
Period *Obligations*
06/01/88-11/30/89 FY89: \$30,000 TOTAL: \$53,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Lawler, J. E. GSFC/Leckrone, D. S. 13-Physics

NAG 5-1078 University of Wisconsin - Madison 6398
A new connection between visual and ultraviolet interstellar extinction
Period *Obligations*
09/15/88-09/14/90 FY89: TOTAL: \$14,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Clayton, G. GSFC/Kondo, Y. 11-Astronomy

NAG 5-1113 University of Wisconsin - Madison 6399
Collection of radar rainfall and satellite data
Period *Obligations*
12/15/88-06/14/89 FY89: \$28,761 TOTAL: \$28,761
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Martin, D. W. GSFC/Thiele, O. W. 31-Atmos Sci
Hinton, B. B.

NASA'S UNIVERSITY PROGRAM **WISCONSIN (Continued)**

NAG 5-1117 University of Wisconsin - Madison 6400
 Analysis of polar clouds from satellite data using pattern recognition techniques
Period *Obligations*
 01/15/89-01/14/90 FY89: \$49,984 TOTAL: \$49,984
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Smith, W. L. GSFC/Arking, A. 31-Atmos Sci
 Ebert, E. E.

NAG 5-1135 University of Wisconsin - Madison 6401
 Plasma gradient induced errors in spacecraft double electric field probe experiments
Period *Obligations*
 06/01/89-05/31/90 FY89: \$40,000 TOTAL: \$40,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Hershkowitz, N. GSFC/Aggson, T. L. 13-Physics
 Intrator, T.

NAG 8-534 University of Wisconsin - Madison 6402
 Analysis of HEAO 2 solid state spectrometer observations of early type stars
Period *Obligations*
 06/01/85-11/30/88 FY89: TOTAL: \$19,991
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Cassinelli, J. P. MSFC/Johnson, W. G. 11-Astronomy

NAG 8-602 University of Wisconsin - Madison 6403
 The X ray spectra of early type stars interpreted as arising from strong shocks in the winds
Period *Obligations*
 09/01/86-08/31/89 FY89: TOTAL: \$28,202
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Cassinelli, J. P. MSFC/Potter, P. Y. 11-Astronomy

NAG 8-705 University of Wisconsin - Madison 6404
 Crystal growth by two modified floating zone processes
Period *Obligations*
 03/01/88-02/28/90 FY89: \$78,670 TOTAL: \$153,440
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Kou, S. MSFC/Lehoczy, S. L. 47-Materials Engr

NAG 8-725 University of Wisconsin - Madison 6405
 Comparative X ray and optical studies of nearby Abell clusters
Period *Obligations*
 06/01/88-09/30/89 FY89: TOTAL: \$31,616
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Hoessel, J. G. MSFC/Harper, B. 11-Astronomy

NAG 8-771 University of Wisconsin - Madison 6406
 Containerless processing of undercooled melts
Period *Obligations*
 03/01/89-03/01/90 FY89: \$160,000 TOTAL: \$160,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Perepezko, J. H. MSFC/Robinson, M. B. 47-Materials Engr

NAG 8-786 University of Wisconsin - Madison 6407
 Dynamical investigations of the middle atmosphere with a 2-D model
Period *Obligations*
 09/01/89-08/31/90 FY89: \$63,000 TOTAL: \$63,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Hitchman, M. H. MSFC/Miller, T. L. 31-Atmos Sci
 Brasseur, G. MSFC/Leslie, F. W.

NAG 9-171 University of Wisconsin - Madison 6408
 Investigations in sensory augmentation devices
Period *Obligations*
 07/15/86-11/01/88 FY89: TOTAL: \$146,711
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Bach-y-rita, P. JSC/Tri, T. O. 54-Env Biology

NAG 9-189 University of Wisconsin - Madison 6409
 Fluid inclusions and crustal evolution in the Archean Pikwitonei domain Manitoba
Period *Obligations*
 02/01/87-03/01/89 FY89: TOTAL: \$39,500
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Brown, P. E. JSC/Phinney, W. C. 32-Geological Sci

NAGW 422 University of Wisconsin - Madison 6410
 Studies of ultraviolet intrinsic polarization of stars
Period *Obligations*
 04/01/83-02/28/90 FY89: \$43,274 TOTAL: \$238,893
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Cassinella, V. HQ-EZ/Clayton, G. C. 11-Astronomy
 HQ-EZ/Weiler, E. J.

NAGW 695 University of Wisconsin - Madison 6411
 Ground-based obs of comet Halley/Giacovini-Finner/Jup 10
Period *Obligations*
 01/15/85-06/30/90 FY89: \$50,000 TOTAL: \$220,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Scherb, F. HQ-EL/Brinton, H. C. 11-Astronomy
 HQ-EL/Rahe, J. H.

NAGW 756 University of Wisconsin - Madison 6412
 Statistical analysis of stratospheric ozone and temperature data for trends
Period *Obligations*
 07/01/85-09/30/88 FY89: TOTAL: \$155,005
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Reinsel, G. C. HQ-EE/Jackman, C. H. 31-Atmos Sci
 HQ-EE/Butler, D. M.

NAGW 872 University of Wisconsin - Madison 6413
 No cost extension satellite imagery
Period *Obligations*
 02/17/86-08/16/89 FY89: TOTAL: \$94,267
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Weinman, J. A. HQ-E/Rosendhal, J. D. 31-Atmos Sci
 HQ-EP/Konkel, R. M.

NAGW 905 University of Wisconsin - Madison 6414
 Charged particle acceleration mechanisms in space plasmas double layers
Period *Obligations*
 06/01/86-05/31/89 FY89: TOTAL: \$190,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Hershkowitz, N. HQ-ES/Mellott, M. M. 13-Physics
 HQ-ES/Parks, G. K.

NAGW 920 University of Wisconsin - Madison 6415
 Use of microwave satellite data to study variations in rainfall over the Indian ocean
Period *Obligations*
 08/01/86-11/30/89 FY89: \$91,195 TOTAL: \$279,336
Prin. Invest. *NASA Tech. Officer* *CASE Category*
 Martin, D. W. HQ-EE/Dodge, J. C. 31-Atmos Sci
 Hinton, B.

NASA'S UNIVERSITY PROGRAM **WISCONSIN (Continued)**

NAGW 937 University of Wisconsin - Madison 6416
 Cloud level circulation on Venus
Period Obligations
 07/01/86-06/30/89 FY89: TOTAL: \$118,514
Prin. Invest. NASA Tech. Officer CASE Category
 Limaye, S. S. HQ-EL/Fox, K. 31-Atmos Sci
 HQ-EL/Quaide, W. L.

NAGW 975 University of Wisconsin - Madison 6417
 A center for the commercial development of space
Period Obligations
 09/01/86-08/30/90 FY89: \$310,000 TOTAL: \$3,368,000
Prin. Invest. NASA Tech. Officer CASE Category
 Bula, R. J. HQ-IC/Oran, W. 51-Biological Sci
 Duffie, N. HQ/Villamil, A.

NAGW 1318 University of Wisconsin - Madison 6418
 U.S. Europe multi-purpose network gateways
Period Obligations
 06/01/88-03/31/89 FY89: TOTAL: \$38,988
Prin. Invest. NASA Tech. Officer CASE Category
 Landweber, L. H. HQ-EC/Villasenor, A. J. 22-Computer Science

NAGW 1411 University of Wisconsin - Madison 6419
 Dynamical investigations of the middle atmosphere with a 2-D model
Period Obligations
 09/01/88-03/31/90 FY89: TOTAL: \$61,999
Prin. Invest. NASA Tech. Officer CASE Category
 Hitchman, M. H. HQ-EE/Prather, M. J. 31-Atmos Sci
 HQ-EE/Watson, R.

NAGW 1469 University of Wisconsin - Madison 6420
 Directional radiance modeling of vegetation in thermal and solar wavebands
Period Obligations
 12/01/88-11/30/89 FY89: \$97,098 TOTAL: \$97,098
Prin. Invest. NASA Tech. Officer CASE Category
 Norman, J. HQ-EE/Asrar, G. 19-Phys Sci, NEC
 Tanner, C. B. HQ-EE/Ruzek, M.

NAGW 1575 University of Wisconsin - Madison 6421
 Plant architecture growth and radiative transfer for terrestrial and space environments
Period Obligations
 02/01/89-01/31/90 FY89: \$181,764 TOTAL: \$181,764
Prin. Invest. NASA Tech. Officer CASE Category
 Norman, J. M. HQ-E/Alexander, J. K. 59-Life Sci, NEC
 HQ-E/Holland, D. A.

NAGW 1745 University of Wisconsin - Madison 6422
 The impact of cold frontal passages on geomorphic evolution of the Louisiana coast
Period Obligations
 01/01/89-12/31/89 FY89: \$300,000 TOTAL: \$300,000
Prin. Invest. NASA Tech. Officer CASE Category
 Menzel, W. P. HQ-EE/Dodge, J. C. 31-Atmos Sci
 Roberts, H. H. HQ-EE/Tuyahov, A.

NAGW 1767 University of Wisconsin - Madison 6423
 Application of lightning data to satellite based rainfall estimation
Period Obligations
 01/01/89-12/31/89 FY89: \$72,000 TOTAL: \$72,000
Prin. Invest. NASA Tech. Officer CASE Category
 Martin, D. W. HQ-EE/Dodge, J. C. 31-Atmos Sci
 Hinton, B. B. HQ-EE/Theon, J. S.

NAGW 1768 University of Wisconsin - Madison 6424
 Theoretical studies and interstellar dust
Period Obligations
 06/01/89-05/31/90 FY89: \$37,988 TOTAL: \$37,988
Prin. Invest. NASA Tech. Officer CASE Category
 Mathis, J. S. HQ-EZ/Clayton, G. C. 11-Astronomy

NAGW 1773 University of Wisconsin - Madison 6425
 Search for ice sheet elevation changes in east antarctica using repeat satellite altimetry
Period Obligations
 09/01/89-02/28/90 FY89: \$51,780 TOTAL: \$51,780
Prin. Invest. NASA Tech. Officer CASE Category
 Bentley, C. R. HQ-EE/Thomas, R. H. 33-Oceanography
 HQ-EE/Wilson, W. S.

NAGW 1778 University of Wisconsin - Madison 6426
 Laboratory studies of space phenomena
Period Obligations
 06/01/89-05/31/90 FY89: \$80,000 TOTAL: \$80,000
Prin. Invest. NASA Tech. Officer CASE Category
 Hershkowitz, N. HQ-ES/Mellott, M. M. 13-Physics
 HQ-ES/Perry, T. W.

NAGW 10-64 University of Wisconsin - Madison 6427
 Microgravity effects during fertilization, cue division, development and calcium metabolism in sea urchins
Period Obligations
 08/01/89-02/28/99 FY89: \$60,983 TOTAL: \$60,983
Prin. Invest. NASA Tech. Officer CASE Category
 Schatten, H. KSC/Knott, W. 54-Env Biology

NAS 1-18272 University of Wisconsin - Madison 6428
 Earth radiation budget experiment ERBE
Period Obligations
 05/05/86-05/31/93 FY89: \$221,016 TOTAL: \$642,016
Prin. Invest. NASA Tech. Officer CASE Category
 Smith, W. L. LARC/Cooper, J. E. 31-Atmos Sci
 LARC/Barkstrom, B. R.

NAS 2-12078 University of Wisconsin - Madison 6429
 Co-investigator support on the Galileo net flux radiometer experiment
Period Obligations
 01/01/85-12/31/89 FY89: \$182,281 TOTAL: \$1,399,181
Prin. Invest. NASA Tech. Officer CASE Category
 Sromovsky, L. A. ARC/Twarowski, R. J. 99-Multi-Discip

NAS 2-12939 University of Wisconsin - Madison 6430
 Operation and maintenance of squirrel monkey colony
Period Obligations
 06/01/89-12/12/90 FY89: \$180,200 TOTAL: \$180,200
Prin. Invest. NASA Tech. Officer CASE Category
 Coe, L. ARC/Hower, W. L. 51-Biological Sci
 Reinhardt, V. ARC/Ferandin, J. A.
 Chrispen, H.

NAS 5-24487 University of Wisconsin - Madison 6431
 High speed photometer for the space telescope printer
Period Obligations
 03/08/78-11/30/89 FY89: \$1,081,594 TOTAL: \$11,046,204
Prin. Invest. NASA Tech. Officer CASE Category
 Bliss, R. GSFC/Barr, A. 11-Astronomy
 GSFC/Sours, W.

NASA'S UNIVERSITY PROGRAM **WISCONSIN (Continued)**

NAS 5-26078 University of Wisconsin - Madison 6432
Generate an investigation development plan and establish preliminary interfaces for the diffuse soft X-ray Bragg spectrometer

Period	Obligations	
03/10/80-04/03/93	FY89: \$650,000	TOTAL: \$6,440,372
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Kraushaar, W. L.	GSFC/Ladaudio, J.	11-Astronomy

NAS 5-26777 University of Wisconsin - Madison 6433
Development phase of the Wisconsin ultraviolet photo polarimeter experiment (WUPPE)

Period	Obligations	
09/04/81-09/30/94	FY89: \$1,162,000	TOTAL: \$9,683,760
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Code, A. D.	MSFC/Owens, J.	11-Astronomy
Nordsieck, K.		

NAS 5-29368 University of Wisconsin - Madison 6434
Science verification calibration and guaranteed time observations of the high resolution spectrograph

Period	Obligations	
09/16/86-09/15/91	FY89: \$171,000	TOTAL: \$383,671
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Savage, B. D.	GSFC/Vitagliano, H. D.	11-Astronomy

NAS 5-29448 University of Wisconsin - Madison 6435
Guaranteed time observation of space telescope *

Period	Obligations	
05/01/86-05/31/90	FY89: \$270,000	TOTAL: \$358,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Bless, R.	GSFC/Leckrone, D. A.	42-Astro Engr

NAS 5-30131 University of Wisconsin - Madison 6436
CO investigator for space telescope imaging spectrograph program

Period	Obligations	
09/22/87-10/30/89	FY89: \$5,000	TOTAL: \$8,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Roesler, F.	GSFC/Vitagliano, H. D.	11-Astronomy

NAS 8-35981 University of Wisconsin - Madison 6437
Studies of lightning data in conjunction with geostationary satellite data

Period	Obligations	
06/23/84-12/22/87	FY89:	TOTAL: \$112,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Martin, D.	MSFC/Christian, H. J.	31-Atmos Sci
Mosher, F. R.	MSFC/Arnold, J. E.	

NAS 8-36168 University of Wisconsin - Madison 6438
Meteorological satellite products support for project COHMECH

Period	Obligations	
04/25/86-10/24/88	FY89:	TOTAL: \$146,461
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Smith, W. L.	MSFC/Greene, W. M.	31-Atmos Sci
Verden, C. L.	MSFC/Smith, G. T.	

NAS 8-36169 University of Wisconsin - Madison 6439
Determination of atmospheric moisture structure and infrared cooling rotors from high resolution mams radiance data

Period	Obligations	
09/19/86-09/18/91	FY89: \$36,000	TOTAL: \$352,800
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Menzel, W. P.	MSFC/Greene, W. M.	31-Atmos Sci
	MSFC/Smith, G. T.	

NAS 8-36292 University of Wisconsin - Madison 6440
Management and display of four-dimensional environmental data sets using mcidas

Period	Obligations	
02/28/86-02/28/90	FY89: \$255,203	TOTAL: \$962,203
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Suomi, V. E.	MSFC/Meyer, P. J.	31-Atmos Sci
Hibbard, W.	MSFC/Vinz, F. L.	
Krauss, R. J.		

NAS 8-36547 University of Wisconsin - Madison 6441
Investigation of the detection of rotating thunderstorms by storm top features as observed by meteorological satellite

Period	Obligations	
09/27/85-09/15/88	FY89:	TOTAL: \$175,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Anderson, C. E.	MSFC/Green, W. M.	31-Atmos Sci
	MSFC/Smith, G. T.	

NAS 8-37587 University of Wisconsin - Madison 6442
Implementation of the wetnet system ces and applic info system proto type

Period	Obligations	
11/30/88-03/26/93	FY89: \$415,000	TOTAL: \$415,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Suomi, V. E.	MSFC/Hood, R. E.	31-Atmos Sci
Young, J. T.	MSFC/Spencer, R. W.	

NAS 9-17642 University of Wisconsin - Madison 6443
Meteorological data display systems

Period	Obligations	
05/15/86-12/01/89	FY89: \$1,338,273	TOTAL: \$5,095,383
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Young, J. T.	JSC/Whitehead, V.	31-Atmos Sci

NCC 2-301 University of Wisconsin - Madison 6444
Growth of potatoes for CELSS

Period	Obligations	
05/01/84-11/30/89	FY89: \$135,000	TOTAL: \$719,023
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Tibbitts, T. W.	ARC/MacElroy, R. D.	51-Biological Sci
Von Elbe, J.		
Palta, J. P.		

NCC 2-542 University of Wisconsin - Madison 6445
Psychophysical evaluation of three dimensional auditory displays

Period	Obligations	
05/01/88-04/30/90	FY89: \$113,882	TOTAL: \$213,891
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Wightman, F. L.	ARC/Wenzel, E. M.	69-Psych, NEC

NCC 2-619 University of Wisconsin - Madison 6446
Preliminary pilot data for SLS experimental protocol biochemical morphological and biomechanical properties of rat bones

Period	Obligations	
06/01/89-12/31/89	FY89: \$20,000	TOTAL: \$20,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Vailas, A. C.	ARC/Holton, E. M.	51-Biological Sci

NCC 8-11 University of Wisconsin - Madison 6447
The role of current and future remote sensing data systems in numerical meteorology

Period	Obligations	
09/28/87-07/30/88	FY89:	TOTAL: \$41,706
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Diak, G.	MSFC/Robertson, F.	31-Atmos Sci

NASA'S UNIVERSITY PROGRAM **WISCONSIN (Continued)**

NCC 8-12 University of Wisconsin - Madison 6448
The role of current and future remote sensing data systems in numerical meteorology

Period	Obligations	
03/25/88-03/30/90	FY89: \$50,000	TOTAL: \$115,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Diak, G.	MSFC/Robertson, F.	31-Atmos Sci

NAG 8-617 University of Wisconsin - Milwaukee 6456
Turbulence modeling and its application to the Space Shuttle main engine

Period	Obligations	
01/29/87-01/29/88	FY89:	TOTAL: \$51,924
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Amano, R.	MSFC/Schafer, C. F.	46-Mech Engr
	MSFC/Kaufman, J. W.	

NGR 50-002-189 University of Wisconsin - Madison 6449
Cloud image processing for planetary flybys

Period	Obligations	
01/19/72-09/30/89	FY89: \$79,500	TOTAL: \$905,893
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Sromov, L. A.	HQ-EL/Fox, K.	31-Atmos Sci
	HQ-EL/Quaide, W. L.	

NAGW 839 University of Wisconsin - Milwaukee 6457
Isolation and characterization of methanotrophs capable of growth at low methane concentrations

Period	Obligations	
10/01/85-05/31/89	FY89: \$23,566	TOTAL: \$319,810
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Lidstrom, M. E.	HQ-EE/Kurylo, M. J.	39-Env Sci, NEC
Remsen, C. C.	HQ-EE/Watson, R. T.	

NGT 00-050-267 University of Wisconsin - Madison 6450
NASA graduate student researchers program

Period	Obligations	
08/01/88-07/31/90	FY89: \$18,000	TOTAL: \$36,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Becker, W.	HQ-XE/Owens, F. C.	51-Biological Sci

NAGW 1047 University of Wisconsin - Milwaukee 6458
Remote sensing of biochemical cycle the manganese cycle in freshwater lake

Period	Obligations	
02/01/87-01/31/90	FY89: \$45,000	TOTAL: \$142,806
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Nealson, K. H.	HQ-EE/Wickland, D. E.	54-Env Biology
Richardson, L.	HQ-EE/Ruzek, M. J.	
Mills, E. L.		

NGT 00-050-426 University of Wisconsin - Madison 6451
NASA graduate student researchers program

Period	Obligations	
09/01/89-09/04/90	FY89: \$17,080	TOTAL: \$17,080
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Savage, B. D.	HQ-XE/Owens, F. C.	13-Physics

NAGW 1063 University of Wisconsin - Milwaukee 6459
Summer program in planetary biology and microbial ecology biogeochemistry of metals

Period	Obligations	
04/15/87-07/14/88	FY89:	TOTAL: \$107,601
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Nealson, K. H.	HQ-EB/Averner, M. M.	51-Biological Sci

NGT 00-070-024 University of Wisconsin - Madison 6452
Graduate student researchers underrepresented minority focus program

Period	Obligations	
08/01/87-07/31/89	FY89: \$1,352	TOTAL: \$19,352
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Savage, B. D.	HQ-XE/Owens, F. C.	11-Astronomy

NAS 8-37914 University of Wisconsin - Milwaukee 6460
Space station microbiological monitoring

Period	Obligations	
10/07/88-10/07/91	FY89: \$250,000	TOTAL: \$250,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Boraas, M. E.	MSFC/Rodgers, E. B.	54-Env Biology
Seale, D. B.		

NGT 00-070-093 University of Wisconsin - Madison 6453
NASA graduate student researchers underrepresented minority focus program

Period	Obligations	
09/01/88-08/31/90	FY89:	TOTAL: \$18,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Vailas, A.	HQ-XE/Owens, F. C.	99-Multi-Discip

WYOMING

NGT 00-070-119 University of Wisconsin - Madison 6454
NASA graduate student researchers program

Period	Obligations	
07/01/89-06/30/90	FY89: \$18,000	TOTAL: \$18,000
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Norman, J. M.	HQ-XE/Owens, F. C.	46-Mech Engr

NAG 1-277 University of Wyoming 6461
Investigation of the relations between neat resin and advanced composite mechanical properties

Period	Obligations	
05/03/82-10/31/88	FY89:	TOTAL: \$219,511
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Zimmerman, R. S.	LARC/Johnston, N. J.	47-Materials Engr
Adams, D. F.	LARC/Hinkley, J. A.	

NGT 50-002-802 University of Wisconsin - Madison 6455
NASA graduate student researchers program

Period	Obligations	
06/01/85-05/31/88	FY89:	TOTAL: \$52,328
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Herman, G. F.	HQ-LE/Owens, F. C.	39-Env Sci, NEC

NAG 1-674 University of Wyoming 6462
Thermal and spectrum loading effects on strain energy release rate during fatigue testing utilizing the edge delamination test

Period	Obligations	
07/01/86-09/30/88	FY89:	TOTAL: \$49,596
<i>Prin. Invest.</i>	<i>NASA Tech. Officer</i>	<i>CASE Category</i>
Zimmerman, R. S.	LARC/O'Brien, T. K.	41-Aero Engr
Adams, D. F.	LARC/Johnston, N. J.	

NASA'S UNIVERSITY PROGRAM **WYOMING (Continued)**

NAG 2-134 University of Wyoming 6463
The study of star formation and molecular cloud evolution using the Kuiper Airborne Observatory

Period	Obligations	
10/01/81-10/31/89	FY89: \$29,936	TOTAL: \$311,346
Prin. Invest.	NASA Tech. Officer	CASE Category
Thronson, H. A., Jr.	ARC/Haughney, L. C.	11-Astronomy

NAG 2-470 University of Wyoming 6464
Single fiber tension and creep testing of metal coated ceramic fibers at various temperatures

Period	Obligations	
07/01/87-03/31/89	FY89:	TOTAL: \$24,692
Prin. Invest.	NASA Tech. Officer	CASE Category
Zimmerman, R. S.	ARC/Kourtidis, D. A.	47-Materials Engr
Adams, D. F.		

NAG 5-913 University of Wyoming 6465
An airborne study of microwave surface sensing and boundary layer heat and moisture fluxes

Period	Obligations	
06/01/87-01/31/90	FY89: \$58,010	TOTAL: \$246,247
Prin. Invest.	NASA Tech. Officer	CASE Category
Kelly, R. D.	GSFC/Owe, M.	39-Env Sci, NEC
Moore, R. K.	GSFC/Hall, F.	

NAG 5-1245 University of Wyoming 6466
Galactic structure as revealed by sources in image recovered infrared astronomical satellite (IRAS) data

Period	Obligations	
09/01/89-11/30/89	FY89: \$14,000	TOTAL: \$14,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Canterna, R. W.	GSFC/West, D.	11-Astronomy

NAG 5-1246 University of Wyoming 6467
Image reconstruction of infrared astronomical satellite (IRAS) survey scans

Period	Obligations	
09/01/89-11/30/89	FY89: \$7,500	TOTAL: \$7,500
Prin. Invest.	NASA Tech. Officer	CASE Category
Bontekoe, T. R.	GSFC/West, D.	11-Astronomy

NAGW 1276 University of Wyoming 6468
Infrared speckle interferometry and spectroscopy of Io

Period	Obligations	
01/01/88-11/30/89	FY89: \$22,898	TOTAL: \$47,885
Prin. Invest.	NASA Tech. Officer	CASE Category
Howell, R. R.	HQ-EL/Brinton, H. C.	11-Astronomy
	HQ-EL/Rahe, J. H.	

NAS 1-17735 University of Wyoming 6469
Balloon borne aerosol measurements in support of SAGE II mission

Period	Obligations	
07/16/84-04/30/90	FY89: \$14,700	TOTAL: \$230,733
Prin. Invest.	NASA Tech. Officer	CASE Category
Hoffman, D. J.	LARC/Owens, T. L.	31-Atmos Sci
	LARC/McMaster, L. R.	

NAS 1-18495 University of Wyoming 6470
Erbs SAGE II scientific investigation

Period	Obligations	
05/04/87-05/03/90	FY89: \$20,000	TOTAL: \$60,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Pepin, T.	LARC/Maddrea, G. L.	31-Atmos Sci
	LARC/McMaster, L. R.	

NCA 2-376 University of Wyoming 6471
Improving the efficiency of implicit local linearization factorizations for calculating 3d Navier-Stokes steady state solutions

Period	Obligations	
01/01/89-12/31/89	FY89: \$20,000	TOTAL: \$20,000
Prin. Invest.	NASA Tech. Officer	CASE Category
George, J. H.	ARC/Holst, T. L.	21-Mathematics
	ARC/Flores, J.	

PUERTO RICO

NAGW 849 University of Puerto Rico - Mayaguez 6472
Remote sensing research program

Period	Obligations	
01/01/86-06/30/89	FY89: \$202,828	TOTAL: \$502,828
Prin. Invest.	NASA Tech. Officer	CASE Category
Gonzales-Iagoo H, J. G.	HQ-EE/Tuyahov, A. J.	39-Env Sci, NEC
Lawrence, W.		

NCC 2-496 University of Puerto Rico - Mayaguez 6473
The role of aviation technology in the Caribbean basin

Period	Obligations	
08/01/87-10/31/88	FY89:	TOTAL: \$25,970
Prin. Invest.	NASA Tech. Officer	CASE Category
Hess, R. A.	ARC/Alton, L. R.	41-Aero Engr
Wayland, K.		

NGT 00-050-255 University of Puerto Rico - Mayaguez 6474
NASA graduate student researchers program

Period	Obligations	
01/04/88-01/03/90	FY89: \$16,660	TOTAL: \$33,260
Prin. Invest.	NASA Tech. Officer	CASE Category
Alvarez, J.	HQ-XE/Owens, F. C.	45-Elec Engr

NGT 00-070-099 University of Puerto Rico - Mayaguez 6475
Graduate student researchers underrepresented minority focus program

Period	Obligations	
08/15/88-08/14/89	FY89: \$18,000	TOTAL: \$18,000
Prin. Invest.	NASA Tech. Officer	CASE Category
Lopez, J. M.	HQ-XE/Owens, F. C.	33-Oceanography

NGT 00-070-141 University of Puerto Rico - Mayaguez 6476
NASA graduate student researchers underrepresented minority focus program

Period	Obligations	
08/01/89-07/31/90	FY89: \$17,820	TOTAL: \$17,820
Prin. Invest.	NASA Tech. Officer	CASE Category
Lawrence, W. T.	HQ-XE/Owens, F. C.	54-Env Biology

NGT 00-070-149 University of Puerto Rico - Mayaguez 6477
NASA graduate student researchers underrepresented minority focus program

Period	Obligations	
07/01/89-06/30/90	FY89: \$17,520	TOTAL: \$17,520
Prin. Invest.	NASA Tech. Officer	CASE Category
Vasquez, R. E.	HQ-XE/Owens, F. C.	45-Elec Engr

NGT 00-070-150 University of Puerto Rico - Mayaguez 6478
NASA graduate student researchers program

Period	Obligations	
07/01/89-06/30/90	FY89: \$17,520	TOTAL: \$17,520
Prin. Invest.	NASA Tech. Officer	CASE Category
Vasquez, R. E.	HQ-XE/Owens, F. C.	45-Elec Engr

NASA'S UNIVERSITY PROGRAM **PUERTO RICO (Continued)**

NGT 51-001-800 University of Puerto Rico - Mayaguez 6479
NASA graduate student researchers program

Period	Obligations	
10/01/85-09/30/88	FY89:	TOTAL: \$47,831
<i>Prin. Invest.</i>	NASA Tech. Officer	CASE Category
Gonzalez, J. G.	HQ-LE/Owens, F. C.	51-Biological Sci

NAS 5-30547 McGill University 6486
Install radar data digitizer system

Period	Obligations	
03/07/89-12/15/89	FY89: \$33,318	TOTAL: \$33,318
<i>Prin. Invest.</i>	NASA Tech. Officer	CASE Category
Austin, J.	GSFC/Thiele, O.	11-Astronomy

NGT 00-050-256 University of Puerto Rico 6480
NASA graduate student researchers program

Period	Obligations	
01/01/88-12/31/89	FY89: \$14,000	TOTAL: \$32,000
<i>Prin. Invest.</i>	NASA Tech. Officer	CASE Category
Fetcher, N.	HQ-XE/Owens, F. C.	51-Biological Sci

NAGW 1043 University of Montreal 6487
The consistency of human computer interfaces

Period	Obligations	
03/15/87-03/14/90	FY89: \$82,690	TOTAL: \$82,690
<i>Prin. Invest.</i>	NASA Tech. Officer	CASE Category
Robert, J. M.	ARC/Palmer, E. A.	49-Engr, NEC
	ARC/Remington, R. W.	

NGT 00-070-160 University of Puerto Rico 6481
NASA graduate student researchers underrepresented minority focus program

Period	Obligations	
08/14/89-08/13/90	FY89: \$18,000	TOTAL: \$18,000
<i>Prin. Invest.</i>	NASA Tech. Officer	CASE Category
Baez, A. D.	HQ-XE/Owens, F. C.	32-Geological Sci

NAGW 1234 University of Toronto 6488
Extrapolation of process models of evapotranspiration and net primary productivity in coniferous forests to large spatial scales

Period	Obligations	
11/15/87-11/14/89	FY89: \$43,992	TOTAL: \$88,028
<i>Prin. Invest.</i>	NASA Tech. Officer	CASE Category
Band, L. E.	HQ-EE/Asrar, G.	39-Env Sci, NEC
Running, S. W.	HQ-EE/Wickland, M. J.	
Peterson, D. L.		

AUSTRALIA

NAGW 1467 Australian National University 6482
Optical diagnostics of scramjet combustor

Period	Obligations	
07/01/88-01/31/90	FY89: \$132,000	TOTAL: \$132,000
<i>Prin. Invest.</i>	NASA Tech. Officer	CASE Category
Sandeman, R. J.	LARC/Anderson, G. Y.	41-Aero Engr
	HQ-RN/Suddreth, J. A.	

NAGW 674 University of Queensland 6483
Shock tunnel studies of scramjet phenomena

Period	Obligations	
01/01/85-12/31/89	FY89: \$406,929	TOTAL: \$1,398,617
<i>Prin. Invest.</i>	NASA Tech. Officer	CASE Category
Stalker, R. J.	LARC/Anderson, G. Y.	41-Aero Engr
Morgan, R. G.	HQ-RP/Suddreth, J.	
Paul, A.		

NAGW 728 University of Sydney 6484
Further development and establishment of rarefied flow field analysis capability

Period	Obligations	
02/01/85-12/31/89	FY89: \$100,000	TOTAL: \$380,000
<i>Prin. Invest.</i>	NASA Tech. Officer	CASE Category
Bird, G. A.	LARC/Sutton, K.	41-Aero Engr
	LARC/Moss, J. N.	

NAGW 1457 University of Waterloo 6489
Algorithms and software for solving finite elements

Period	Obligations	
07/01/88-06/30/89	FY89: \$82,631	TOTAL: \$82,631
<i>Prin. Invest.</i>	NASA Tech. Officer	CASE Category
George, J. A.	LARC/Knight, N. F.	29-Math/Computer, NEC
	LARC/Stroud, W. J.	

NAS 5-30294 York University 6490
Hubble space telescope quainted time observations program support

Period	Obligations	
01/20/88-09/16/92	FY89: \$20,000	TOTAL: \$175,000
<i>Prin. Invest.</i>	NASA Tech. Officer	CASE Category
Caldwell, J. J.	GSFC/Kalinowski, J. K.	42-Astro Engr

CHILE

NAS 5-1925 University of Chile 6491
Maintenance and operation of minitrack facilities

Period	Obligations	
09/21/82-10/31/89	FY89: \$3,970,000	TOTAL: \$84,006,306
<i>Prin. Invest.</i>	NASA Tech. Officer	CASE Category
Diaz, E.	GSFC/Bodin, W. J.	99-Multi-Discip
	GSFC/Spintman, D.	

CANADA

NAGW 1466 McGill University 6485
The effects of cloud inhomogeneity on the Earth radiation budget experiment

Period	Obligations	
08/01/88-11/30/89	FY89: \$44,000	TOTAL: \$44,000
<i>Prin. Invest.</i>	NASA Tech. Officer	CASE Category
Davies, R.	LARC/Keynton, R. J.	31-Atmos Sci
	LARC/Barkstrom, B. R.	

GREAT BRITAIN

NAGW 1014 Cambridge University 6492
Fatigue crack closure in an aluminum alloy and a titanium alloy

Period	Obligations	
05/01/87-01/31/89	FY89: \$8,000	TOTAL: \$57,200
<i>Prin. Invest.</i>	NASA Tech. Officer	CASE Category
Fleck, N. A.	LARC/Newman, J. C.	46-Mech Engr
	LARC/Crews, J. H.	

NASA'S UNIVERSITY PROGRAM **GREAT BRITAIN (Continued)**

NAGW 581 Imperial College of Science & Technology 6493
Vortex boundary layer interactions
Period *Obligations*
03/01/84-08/30/88 FY89: TOTAL: \$156,715
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Bradshaw, P. ARC/Peake, D. J. 41-Aero Engr
ARC/Erickson, G.

AGW 1708 Israel Institute of Technology 6500
Multi-disciplinary optimization of aeroservoelastic systems
Period *Obligations*
10/01/89-09/30/90 FY89: \$29,562 TOTAL: \$29,562
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Karpel, M. LARC/Wieseman, C. D. 41-Aero Engr

NAGW 478 University of Wales 6494
Finite element methods of analysis for high speed viscous compressible flow
Period *Obligations*
10/01/83-09/30/89 FY89: TOTAL: \$249,913
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Morgan, K. LARC/Bey, K. S. 29-Math/Computer, NEC
Peraire, J. LARC/Wieting, A. R.
Zienkiewicz, O. C.

NORWAY

NAGW 1315 University of Oslo 6501
The effect of supersonic transportation the stratospheric ozone layer
Period *Obligations*
05/01/88-07/31/89 FY89: TOTAL: \$75,000
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Isaksen, I. S. LARC/Callis, L. B. 31-Atmos Sci
LARC/McCormick, M. P.

NCCW 2 University of Wales 6495
Computer program for buckling of stiffened composite panels with shear loading
Period *Obligations*
10/01/81-01/31/90 FY89: TOTAL: \$165,340
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Williams, F. W. LARC/Starnes, J. H. 46-Mech Engr
LARC/Anderson, M. S.

WEST GERMANY

NAGW 1736 Univ Stuttgart 6502
High power arcjet
Period *Obligations*
05/01/89-04/30/90 FY89: \$138,900 TOTAL: \$138,900
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Schrade, H. O. LERC/Curran, F. M. 42-Astro Engr
Kurtz, M. A. LERC/Carney, L. M.

NSG 7172 University of Southampton 6496
Self-streamlining of the test section of a transonic wind tunnel
Period *Obligations*
10/01/75-09/30/89 FY89: \$24,100 TOTAL: \$543,321
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Goodyer, M. J. LARC/Ladson, C. L. 41-Aero Engr
LARC/Kilgore, R. A.

NSG 7523 University of Southampton 6497
Investigations into the technology required to raise reliability levels of magnetic suspension system
Period *Obligations*
01/01/79-09/30/89 FY89: TOTAL: \$397,266
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Goodyer, M. J. LARC/Boyden, R. P. 41-Aero Engr
LARC/Kilgore, R. A.

ISRAEL

NAGW 1012 Israel Institute of Technology 6498
Using complex computer games as general trainers to improve flight skills
Period *Obligations*
01/01/87-09/30/89 FY89: \$27,050 TOTAL: \$27,050
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Gopher, D. ARC/Hart, S. G. 69-Psych, NEC

NAGW 1128 Israel Institute of Technology 6499
Augmentation and training of pilot perceptual and control capabilities in nap of the Earth flight with night vision systems
Period *Obligations*
07/01/87-09/30/89 FY89: \$79,940 TOTAL: \$79,940
Prin. Invest. *NASA Tech. Officer* *CASE Category*
Gopher, D. ARC/Hart, S. G. 69-Psych, NEC
Merhav, S.
Kimchi, R.

NASA'S UNIVERSITY PROGRAM

APPENDIX

CROSS INDEX BY FIELD OF SCIENCE AND ENGINEERING

The Fields used here are specified by Amendment J, "Standard Classification of Fields of Science and Engineering," to Office of Management and Budget (OMB) Circular A-46, "Standards for Statistical Surveys." Field codes are interpreted as follows:

PHYSICAL SCIENCES	ENVIRONMENTAL SCIENCES (Terrestrial and extraterrestrial)	LIFE SCIENCES	SOCIAL SCIENCES
11 ASTRONOMY	31 ATMOSPHERIC SCIENCES	51 BIOLOGICAL SCIENCES	71 ANTHROPOLOGY
12 CHEMISTRY	32 GEOLOGICAL SCIENCES	54 ENVIRONMENTAL BIOLOGY	72 ECONOMICS
13 PHYSICS	33 OCEANOGRAPHY	55 AGRICULTURAL SCIENCES	73 HISTORY
19 PHYSICAL SCIENCES, NEC*	39 ENVIRONMENTAL SCIENCES, NEC*	56 MEDICAL SCIENCES	74 LINGUISTICS
		59 LIFE SCIENCES, NEC*	75 POLITICAL SCIENCE
			76 SOCIOLOGY
			79 SOCIAL SCIENCE, NEC*
MATHEMATICAL/COMP SCI	ENGINEERING	PSYCHOLOGY	OTHER SCIENCES**
21 MATHEMATICS	41 AERONAUTICAL	61 BIOLOGICAL	99 ALL DISCIPLINE(S)
22 COMPUTER SCIENCES	42 ASTRONAUTICAL	62 SOCIAL ASPECTS	
29 MATHEMATICAL COMPUTER SCIENCES, NEC*	43 CHEMICAL	69 PSYCHOLOGY, NEC*	
	44 CIVIL		
	45 ELECTRICAL		
	46 MECHANICAL		
	47 METALLURGY AND MATERIALS		
	49 ENGINEERING, NEC*		

*Not Elsewhere Classified (For interdisciplinary projects and others not listed by discipline name)

**For interdisciplinary projects which cannot be classified within any of the preceding main fields

Abbreviations used in the "Technical Officer Locations" column are discussed in the prefatory pages.

FIELD CODE	INSTITUTION	TECHNICAL OFFICER	TECH OFF LOC	FIRST PRINCIPAL INVESTIGATOR	AGREEMENT NUMBER	ACC NO.
11	ALABAMA A&M UNIV	Darbro, W.	MSFC	George, M. C.	NAG 8-36	1004
11	ARIZONA STATE UNIV	Lasher, L. E.	ARC	Williams, D. R.	NAG 2-522	1230
11	ARIZONA STATE UNIV	Nishioka, K.	ARC	Levey, E. H.	NCC 2-348	1272
11	ARIZONA STATE UNIV	West, D. K.	GSFC	Holberg, J. B.	NAG 5-481	1238
11	ARIZONA STATE UNIV	Kondo, Y.	GSFC	Burstein, D.	NAG 5-547	1239
11	ARIZONA STATE UNIV	West, D. K.	GSFC	Cowley, A. P.	NAG 5-996	1240
11	ARIZONA STATE UNIV	Kondo, Y.	GSFC	Stryker, L.	NAG 5-1006	1241
11	ARIZONA STATE UNIV	West, D.	GSFC	Stryker, L. L.	NAG 5-1159	1242
11	ARIZONA STATE UNIV	West, D. K.	GSFC	Windhorst, R. A.	NAG 5-1172	1243
11	ARIZONA STATE UNIV	Dorries, A. M.	MSFC	Romanishin, W.	NAG 8-576	1244
11	ARIZONA STATE UNIV	Harper, B. A.	MSFC	Burstein, D.	NAG 8-665	1245
11	ARIZONA STATE UNIV	Harper, B. A.	MSFC	Burstein, D.	NAG 8-734	1246
11	ARIZONA STATE UNIV	Harvisik, D.	MSFC	Cowley, A. P.	NAG 8-756	1247
11	ARIZONA STATE UNIV	Brinton, H. C.	HQ-EL	Wyckoff, S.	NAGW 547	1255
11	BAYLOR UNIVERSITY	Brinton, H. C.	HQ-EL	Alexander, W. M.	NAGW 1308	5549
11	BAYLOR UNIVERSITY	Brunk, W. E.	HQ-EL	Alexander, W. M.	NASW 3577	5550
11	BELOIT COLLEGE	Taylor, W. E.	MSFC	Schroeder, D. J.	NAS 8-32901	6364
11	BOSTON COLLEGE	West, D.	GSFC	Bania, T. M.	NAG 5-1193	3641
11	BOSTON UNIVERSITY	Haas, M. R.	ARC	Pohorille, A.	NCA 2-321	3657
11	BOSTON UNIVERSITY	West, D.	GSFC	Clemens, D. P.	NAG 5-1160	3646
11	BOSTON UNIVERSITY	Harper, B.	MSFC	Marscher, A. P.	NAG 8-671	3647
11	BOSTON UNIVERSITY	Kaluzienski, L. J.	HQ-EZ	Marscher, A. P.	NAGW 1608	3652
11	BOSTON UNIVERSITY	Owens, F. C.	HQ-XE	Marcher, A. P.	NGT 00-050-314	3658
11	CALIF INST OF TECH	Haughney, L. C.	ARC	Phillips, T. G.	NAG 2-1	1497
11	CALIF INST OF TECH	Haughney, L. C.	ARC	Mundy, L.	NAG 2-476	1498
11	CALIF INST OF TECH	Haughney, L. C.	ARC	Scoville, N. Z.	NAG 2-534	1499
11	CALIF INST OF TECH	Wales, R.	GSFC	Stone, E. C.	NAG 5-722	1501
11	CALIF INST OF TECH	Kondo, Y.	GSFC	Cohen, J. G.	NAG 5-958	1507
11	CALIF INST OF TECH	Crannell, C. J.	GSFC	Zirin, H.	NAG 5-998	1508
11	CALIF INST OF TECH	West, D.	GSFC	Phillips, T. G.	NAG 5-1153	1510
11	CALIF INST OF TECH	West, D.	GSFC	Scoville, N. Z.	NAG 5-1161	1511
11	CALIF INST OF TECH	West, D.	GSFC	Saifer, B. T.	NAG 5-1162	1512

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11	CALIF INST OF TECH	West, D.	GSFC	Neugebauer, G.	NAG 5-1163	1513
11	CALIF INST OF TECH	West, D.	GSFC	Kulkarni, S. R.	NAG 5-1164	1514
11	CALIF INST OF TECH	West, D.	GSFC	Sargent, A. I.	NAG 5-1165	1515
11	CALIF INST OF TECH	West, D.	GSFC	Djorgovski, S.	NAG 5-1173	1516
11	CALIF INST OF TECH	Stich, K.	GSFC	Westphal, J.	NAS 5-25451	1556
11	CALIF INST OF TECH	Mercanti, E.	GSFC	Stone, E. C.	NAS 5-30340	1558
11	CALIF INST OF TECH	Havrisik, D.	MSFC	Stone, E. C.	NAG 8-502	1518
11	CALIF INST OF TECH	Harper, B. A.	MSFC	Mewaldt, R. A.	NAG 8-678	1520
11	CALIF INST OF TECH	Hagyard, M. J.	MSFC	Zirin, H.	NAG 8-707	1521
11	CALIF INST OF TECH	Dabbs, J. R.	MSFC	Zirin, H.	NAG 8-776	1522
11	CALIF INST OF TECH	Quaide, W. L.	HQ-EL	Yung, Y. L.	NAGW 1204	1535
11	CALIF INST OF TECH	Quaide, W. L.	HQ-EL	Murray, B.	NAGW 1426	1542
11	CALIF INST OF TECH	Rahe, J. H.	HQ-EL	Muhleman, D. O.	NAGW 1448	1547
11	CALIF INST OF TECH	Rahe, J. H.	HQ-EL	Muhleman, D. O.	NAGW 1499	1549
11	CALIF INST OF TECH	Bergstralh, J. T.	HQ-EL	Yung, Y. L.	NAGW 1509	1550
11	CALIF INST OF TECH	Rahe, J.	HQ-EL	Soifer, B. T.	NAGW 1710	1553
11	CALIF INST OF TECH	Rahe, J. H.	HQ-EL	Muhleman, D. O.	NAGW 1808	1555
11	CALIF INST OF TECH	Brinton, H. C.	HQ-EL	Muhleman, D. O.	NGL 05-002-003	1565
11	CALIF INST OF TECH	Brinton, H. C.	HQ-EL	Soifer, B. T.	NGL 05-002-140	1568
11	CALIF INST OF TECH	Brinton, H. C.	HQ-EL	Muhleman, D. O.	NGR 05-002-114	1569
11	CALIF INST OF TECH	Mellott, M. M.	HQ-ES	Stone, E. C.	NGR 05-002-160	1570
11	CALIF INST OF TECH	Gillett, F. C.	HQ-EZ	Phillips, T. G.	NAGW 107	1531
11	CALIF INST OF TECH	Clayton, G. C.	HQ-EZ	Goldreich, P.	NAGW 1303	1540
11	CALIF INST OF TECH	Gillett, F. C.	HQ-EZ	Sargent, A. I.	NAGW 1478	1548
11	CALIF INST OF TECH	Bohlin, J. D.	HQ-	Hurford, G.	NAGW 1706	1552
11	CALIF INST OF TECH	Owens, F. C.	HQ-XE	Scoville, N. Z.	NGT 00-050-394	1577
11	CASE WESTERN RESERVE	Kaluzienski, L. J.	HQ-EZ	Frye Jr., G. M.	NAGW 451	4894
11	CATHOLIC UNIVERSITY	West, D. K.	GSFC	Bruhweiler, F. C.	NAG 5-296	2634
11	CATHOLIC UNIVERSITY	Hallam, K. L.	GSFC	Bruhweiler, F. C.	NAG 5-596	2637
11	CATHOLIC UNIVERSITY	West, D.	GSFC	Bruhweiler, F. C.	NAG 5-1262	2645
11	CATHOLIC UNIVERSITY	Trombka, J. I.	GSFC	Wernitz, C.	NSG 5066	2652
11	CITADEL MLTRY CO S C	Leckrone, D. S.	GSFC	Adelman, S. J.	NAG 5-921	5451
11	CITY COLLEGE OF N Y	Cassen, P.	ARC	Yuan, C.	NCA 2-186	4434
11	COLBY COLLEGE	Haughney, L. C.	ARC	Campbell, M. F.	NAG 2-546	3434
11	COLUMBIA UNIVERSITY	Kondo, Y.	GSFC	Halpern, J. P.	NAG 5-823	4463
11	COLUMBIA UNIVERSITY	Kondo, Y.	GSFC	Patterson, J. O.	NAG 5-827	4464
11	COLUMBIA UNIVERSITY	Kondo, Y.	GSFC	Martin, C.	NAG 5-967	4466
11	COLUMBIA UNIVERSITY	Kondo, Y.	GSFC	Tytler, D.	NAG-6-991	4467
11	COLUMBIA UNIVERSITY	West, D. K.	GSFC	Martin, C.	NAG 5-1140	4470
11	COLUMBIA UNIVERSITY	West, D. K.	GSFC	Rich, R.	NAG 5-1144	4471
11	COLUMBIA UNIVERSITY	West, D. K.	GSFC	Tytler, D.	NAG 5-1240	4472
11	COLUMBIA UNIVERSITY	Carlson, B.	GSFC	Ruderman, M. A.	NCC 5-37	4502
11	COLUMBIA UNIVERSITY	Havrisik, D.	MSFC	Novick, R.	NAG 8-497	4473
11	COLUMBIA UNIVERSITY	Harper, B. A.	MSFC	Patterson, J.	NAG 8-661	4474
11	COLUMBIA UNIVERSITY	Havrisik, D. M.	MSFC	Helfand, D. J.	NAG 8-664	4475
11	COLUMBIA UNIVERSITY	Harper, B.	MSFC	Patterson, J.	NAG 8-728	4476
11	COLUMBIA UNIVERSITY	Havrisik, D.	MSFC	Patterson, J.	NAG 8-729	4477
11	COLUMBIA UNIVERSITY	Harper, B.	MSFC	Halpern, J.	NAG 8-740	4478
11	COLUMBIA UNIVERSITY	Kaluzienski, L. J.	HQ-EZ	Shaham, J.	NAGW 567	4482
11	COLUMBIA UNIVERSITY	Kaluzienski, L. J.	HQ-EZ	Aprile, E.	NAGW 1370	4489
11	COLUMBIA UNIVERSITY	Kaluzienski, L. J.	HQ-EZ	Shaham, J.	NAGW 1618	4492
11	COLUMBIA UNIVERSITY	Gillett, F. C.	HQ-EZ	Flynn, G.	NSG 7105	4508
11	COLUMBIA UNIVERSITY	Schwartz, E.	HQ-XE	Rich, R. M.	NGT 00-070-102	4507
11	CORNELL UNIVERSITY	Haughney, L. C.	ARC	Herter, T.	NAG 2-207	4511
11	CORNELL UNIVERSITY	Lasher, L. E.	ARC	Turcotte, D. L.	NAG 2-524	4513
11	CORNELL UNIVERSITY	Leidich, C.	ARC	Houck, J.	NAS 2-12524	4562
11	CORNELL UNIVERSITY	Pollack, J. B.	ARC	Squyres, S. W.	NCA 2-381	4569
11	CORNELL UNIVERSITY	West, D.	GSFC	Cordes, J. M.	NAG 5-1247	4529
11	CORNELL UNIVERSITY	West, D.	GSFC	Haynes, M. P.	NAG 5-1248	4530
11	CORNELL UNIVERSITY	West, D.	GSFC	Dermott, S. F.	NAG 5-1261	4531

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11	CORNELL UNIVERSITY	Quaide, W. L.	HQ-EL	Burns, J. A.	NAGW 1187	4547
11	CORNELL UNIVERSITY	Quaide, W. L.	HQ-EL	Dermott, S. F.	NAGW 1202	4551
11	CORNELL UNIVERSITY	Fox, K.	HQ-EL	Thompson, W. R.	NAGW 1444	4556
11	CORNELL UNIVERSITY	Quaide, W. L.	HQ-EL	Darmott, S. F.	NAGW 1447	4557
11	CORNELL UNIVERSITY	Kaluzienski, L. J.	HQ-EZ	Salpeter, E. E.	NAGW 666	4538
11	CORNELL UNIVERSITY	Gillett, F. C.	HQ-EZ	Bauer, S. H.	NAGW 1262	4553
11	CORNELL UNIVERSITY	Owens, F. C.	HQ-EZ	Salpeter, E. E.	NGT 00-050-280	4580
11	CORNELL UNIVERSITY	Owens, F. C.	HQ-XE	Sagen, C.	NGT 00-050-302	4582
11	CORNELL UNIVERSITY	Owens, F. C.	HQ-LE	Nicholson, P. D.	NGT 33-010-804	4589
11	DARTMOUTH COLLEGE	Kondo, Y.	GSFC	Wegner, G. A.	NAG 5-971	4263
11	DARTMOUTH COLLEGE	Kondo, Y.	GSFC	Hudson, M. K.	NAG 5-1077	4264
11	DARTMOUTH COLLEGE	West, D.	GSFC	Wegner, G. A.	NAG 5-1250	4266
11	DARTMOUTH COLLEGE	West, D.	GSFC	Fesen, R. A.	NAG 5-1277	4267
11	DUKE UNIVERSITY	Gillett, F. C.	HQ-EZ	Herbst, E.	NAGW 1259	4759
11	FLORIDA STATE UNIV	Owens, F. C.	HQ-LE	Barclon, A.	NGT 00-050-058	2750
11	GEORGE MASON UNIV	Kaluzienski, L.	HQ-EZ	Kafatos, M.	NAGW 1229	5996
11	GEORGIA INST OF TECH	Lasher, L. E.	ARC	Steffes, P. G.	NAG 2-515	2860
11	GEORGIA STATE UNIV	West, D. K.	GSFC	Miller, H. R.	NAG 5-1141	2907
11	GEORGIA STATE UNIV	West, D. K.	GSFC	Gies, D. R.	NAG 5-1218	2908
11	HARVARD UNIVERSITY	Early, L. J.	GSFC	Kirshner, R. P.	NAG 5-645	3670
11	HARVARD UNIVERSITY	West, D. K.	GSFC	Kirshner, R. P.	NAG 5-841	3673
11	HARVARD UNIVERSITY	Harper, B. A.	MSFC	Kirshner, R. P.	NAG 8-603	3676
11	HARVARD UNIVERSITY	Havrisik, D.	MSFC	Grindlay, J. E.	NAG 8-655	3677
11	HARVARD UNIVERSITY	Alexander, J. K.	HQ-E	Shapiro, I. I.	NSG 7176	3712
11	HARVARD UNIVERSITY	Kaluzienski, L. J.	HQ-EZ	Grindlay, J.	NAGW 624	3683
11	HARVARD UNIVERSITY	Stachnik, R. V.	HQ-EZ	Papaliolios, C.	NAGW 1337	3686
11	HARVARD UNIVERSITY	Kaluzienski, L. J.	HQ-EZ	Grindlay, J. E.	NAGW 1721	3693
11	HARVARD UNIVERSITY	Kaluzienski, L. J.	HQ-EZ	Cameron, A. G.	NGR 22-007-272	3703
11	HARVARD UNIVERSITY	Stachnik, R. V.	HQ-EZ	Parkinson, W. H.	NSG 7304	3713
11	HARVARD UNIVERSITY	Owens, F. C.	HQ-XE	Rosner, R.	NGT 00-050-020	3704
11	HARVARD UNIVERSITY	Owens, F. C.	HQ-XE	Fazio, G. G.	NGT 00-050-352	3709
11	HOWARD UNIVERSITY	Davila, J. M.	GSFC	Kumar, C. K.	NAG 5-772	2693
11	INDIANA U-BLOOMINGTN	Cuzzi, J. N.	ARC	Durisen, R. H.	NAG 2-512	3172
11	INDIANA U-BLOOMINGTN	West, D.	GSFC	Johnson, H. R.	NAG 5-182	3175
11	INDIANA U-BLOOMINGTN	Kondo, Y.	GSFC	Eaton, J.	NAG 5-599	3176
11	INDIANA U-BLOOMINGTN	Kondo, Y.	GSFC	Lugger, P.	NAG 5-962	3178
11	INDIANA U-BLOOMINGTN	Potter, P.	MSFC	Cohn, H. N.	NAG 8-589	3179
11	IOWA STATE UNIV	Kondo, Y.	GSFC	Willson, L. A.	NAG 5-707	3271
11	IOWA STATE UNIV	West, D.	GSFC	Bowen, G.	NAG 5-1181	3273
11	IOWA STATE UNIV	West, D.	GSFC	Appleton, P. N.	NAG 5-1186	3274
11	IOWA STATE UNIV	West, D.	GSFC	Willson, L. A.	NAG 5-1187	3275
11	IOWA STATE UNIV	Gillett, F. C.	HQ-EZ	Struck Marcell H, C.	NAGW 1009	3277
11	JOHNS HOPKINS UNIV	Brien, J. J.	GSFC	Moos, W.	NAG 5-327	3449
11	JOHNS HOPKINS UNIV	West, D.	GSFC	Blair, W. P.	NAG 5-988	3455
11	JOHNS HOPKINS UNIV	Kondo, Y.	GSFC	Wyse, R.	NAG 5-1096	3456
11	JOHNS HOPKINS UNIV	Sonneborn, G.	GSFC	Friedman, S. D.	NAG 5-1119	3458
11	JOHNS HOPKINS UNIV	West, D.	GSFC	Krolik, J. H.	NAG 5-1194	3459
11	JOHNS HOPKINS UNIV	West, D.	GSFC	Blair, W.	NAG 5-1276	3460
11	JOHNS HOPKINS UNIV	West, D.	GSFC	Henry, R. C.	NAG 5-1282	3461
11	JOHNS HOPKINS UNIV	O'brien, J.	GSFC	Moos, W.	NAS 5-30339	3481
11	JOHNS HOPKINS UNIV	West, D.	GSFC	Moos, H. W.	NSG 5393	3493
11	JOHNS HOPKINS UNIV	Harrisik, D. M.	MSFC	Kriss, G. A.	NAG 8-676	3462
11	JOHNS HOPKINS UNIV	Harper, B. A.	MSFC	Long, K. S.	NAG 8-677	3463
11	JOHNS HOPKINS UNIV	Jayroe, R. R.	MSFC	Davidson, A.	NAS 5-27000	3479
11	JOHNS HOPKINS UNIV	Taylor, W. E.	MSFC	Fastie, W. G.	NAS 8-32903	3483
11	JOHNS HOPKINS UNIV	Alexander, J. K.	HQ-E	Krimigas, S. M.	NAGW 865	3470
11	JOHNS HOPKINS UNIV	Peterson, L. E.	HQ-EZ	Davidson, A. F.	NAGW 1098	3472
11	JOHNS HOPKINS UNIV	Kaluzienski, L. J.	HQ-EZ	Krolik, J. H.	NAGW 1748	3475
11	LEHIGH UNIVERSITY	Chackerian, C.	ARC	Lovejoy, R.	NCA 2-293	5267
11	LEHIGH UNIVERSITY	Kondo, Y.	GSFC	McCluskey, G. E.	NSG 5386	5269

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11	LA ST U&A&M COL-BRGE	Cuzzi, J. N.	ARC	Wefel, J. P.	NAG 2-528	3395
11	LA ST U&A&M COL-BRGE	West, D.	GSFC	Drilling, J. S.	NAG 5-71	3396
11	LA ST U&A&M COL-BRGE	West, D.	GSFC	Koester, D.	NAG 5-990	3398
11	MASS INST OF TECH	Haughney, L. C.	ARC	Elliott, J. L.	NAG 2-475	3730
11	MASS INST OF TECH	Wales, R. O.	GSFC	Lazarus, A. J.	NAG 5-584	3758
11	MASS INST OF TECH	Kondo, Y.	GSFC	Remillard, R. A.	NAG 5-977	3767
11	MASS INST OF TECH	West, D. K.	GSFC	Remillard, R. A.	NAG 5-1139	3773
11	MASS INST OF TECH	West, D.	GSFC	Bertschinger, E.	NAG 5-1220	3774
11	MASS INST OF TECH	West, D.	GSFC	Canizares, C. R.	NAG 5-1225	3775
11	MASS INST OF TECH	Ogilvie, K.	GSFC	Lazarus, A.	NAS 5-29325	3837
11	MASS INST OF TECH	Hartman, R. C.	GSFC	Nixon, G.	NAS 5-30426	3838
11	MASS INST OF TECH	Havrisik, D.	MSFC	Bradt, H.	NAG 8-493	3777
11	MASS INST OF TECH	Havrisik, D.	MSFC	Canizares, C. R.	NAG 8-494	3778
11	MASS INST OF TECH	Havrisik, D.	MSFC	Lewin, W. G.	NAG 8-495	3779
11	MASS INST OF TECH	Harper, B.	MSFC	Bradt, H. V.	NAG 8-673	3780
11	MASS INST OF TECH	Havrisik, D.	MSFC	Lewin, W. H.	NAG 8-674	3781
11	MASS INST OF TECH	Havrisik, D.	MSFC	Bradt, H.	NAG 8-691	3782
11	MASS INST OF TECH	Havrisik, D.	MSFC	Lewin, W. H.	NAG 8-700	3783
11	MASS INST OF TECH	Havrisik, D.	MSFC	Clark, G. C.	NAG 8-701	3784
11	MASS INST OF TECH	Havrisik, D.	MSFC	Rappaport, S.	NAG 8-762	3785
11	MASS INST OF TECH	Winkler, C. E.	MSFC	Canizares, C. R.	NAS 8-36748	3845
11	MASS INST OF TECH	Brinton, H. C.	HQ-EL	Jewitt, D. C.	NAGW 770	3800
11	MASS INST OF TECH	Underwood, J. R.	HQ-EL	Solomon, S. C.	NAGW 1077	3805
11	MASS INST OF TECH	Rahe, J. H.	HQ-EL	Burke, B. I.	NAGW 1386	3815
11	MASS INST OF TECH	Rahe, J. H.	HQ-EL	Elliot, J. L.	NAGW 1423	3816
11	MASS INST OF TECH	Rahe, J. H.	HQ-EL	Binzel, R.	NAGW 1450	3817
11	MASS INST OF TECH	Rahe, J. H.	HQ-EL	Elliot, J. L.	NAGW 1494	3818
11	MASS INST OF TECH	Brinton, H. C.	HQ-EL	Elliot, J. L.	NSG 7526	3885
11	MASS INST OF TECH	Gilett, F. C.	HQ-EZ	Cheng, E. S.	NAGW 1139	3808
11	MASS INST OF TECH	Kaluzienski, L. J.	HQ-EZ	Joss, P. C.	NAGW 1545	3820
11	MASS INST OF TECH	Kaluzienski, L. J.	HQ-EZ	Clark, G. W.	NAGW 1694	3825
11	MASS INST OF TECH	Lintott, J.	HQ-EZ	Ricker, G. R.	NASW 4372	3849
11	MASS INST OF TECH	Gilett, F. C.	HQ-EZ	Meyer, S.	NGR 22-009-526	3860
11	MASS INST OF TECH	Kaluzienski, L. J.	HQ-EZ	Ricker, G. R.	NSG 7339	3884
11	MASS INST OF TECH	Kaluzienski, L. J.	HQ-EZ	Clark, G. W.	NSG 7643	3887
11	MCGILL UNIVERSITY	Thiele, O.	GSFC	Austin, J.	NAS 5-30547	6486
11	MICHIGAN STATE UNIV	Kondo, Y.	GSFC	Linnell, A. P.	NAG 5-802	3963
11	MICHIGAN STATE UNIV	West, D.	GSFC	Linnell, A. P.	NAG 5-1189	3964
11	MIDDLEBURY COLLEGE	Kondo, Y.	GSFC	Winkler, P. F.	NAG 5-801	5959
11	MIDDLEBURY COLLEGE	Harper, B. A.	MSFC	Winkler, P. F.	NAG 8-735	5960
11	MONTANA STATE UNIV	West, D.	GSFC	Tsuruta, S.	NAG 5-1229	4227
11	MONTANA STATE UNIV	Harper, B. A.	MSFC	Tsuruta, S.	NAG 8-736	4228
11	MORGAN STATE UNIV	Baker, G. R.	GSFC	Hammond, E. C., Jr.	NSG 5074	3499
11	NEW MEX INST MINING	Witteborn, F. C.	ARC	Eilek, J. A.	NCC 2-364	4382
11	NEW MEX INST MINING	West, D.	GSFC	Shore, S. N.	NAG 5-767	4376
11	NEW MEX INST MINING	Niedier, M.	GSFC	Shore, S. N.	NCA 5-71	4381
11	NEW MEX INST MINING	Kaluzienski, L. J.	HQ-EZ	Eilek, J. A.	NAGW 1591	4379
11	NEW MEX ST U-LAS CR	Thompson, D.	JSC	Burns, J. O.	NAG 9-396	4387
11	NEW MEX ST U-LAS CR	Bergstralh, J. T.	HQ-EL	Beebe, R. F.	NAGW 1506	4392
11	NEW MEX ST U-LAS CR	Rahe, J.	HQ-EL	Reebe, R.	NAGW 1802	4395
11	NEW MEX ST U-LAS CR	Brinton, H. C.	HQ-EL	Beebe, R. F.	NGL 32-003-001	4404
11	NEW MEX ST U-LAS CR	Mellott, M. M.	HQ-ES	Golden, R. L.	NAGW 110	4388
11	NEW YORK UNIVERSITY	Kondo, Y.	GSFC	Glassgold, A. E.	NAG 5-73	4603
11	NEW YORK UNIVERSITY	Mellott, M. M.	HQ-ES	Strauss, H.	NAGW 781	4609
11	NEW YORK UNIVERSITY	Gillett, F. C.	HQ-EZ	Glassgold, A. E.	NAGW 630	4608
11	NO CAROLINA STATE U	Harrisik, D. M.	MSFC	Reynolds, S. P.	NAG 8-731	4800
11	NORTHERN ARIZONA U	Fimmel, R. O.	ARC	Morgan, P.	NAG 2-465	1281
11	NORTHWESTERN UNIV	Werner, M. W.	ARC	Bushouse, H. A.	NCA 2-345	3012
11	NORTHWESTERN UNIV	Early, L. J.	GSFC	Ulmer, M. P.	NAG 5-181	2998
11	NORTHWESTERN UNIV	West, D. K.	GSFC	Zadeh, F. Y.	NAG 5-1146	3002

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11	NORTHWESTERN UNIV	West, D. K.	GSFC	Meyer, D. M.	NAG 5-1147	3003
11	NORTHWESTERN UNIV	Potter, P. Y.	MSFC	Ulmer, M. P.	NAG 8-604	3005
11	NORTHWESTERN UNIV	Havrisik, D.	MSFC	Ulmer, M. P.	NAG 8-681	3006
11	NORTHWESTERN UNIV	Kaluziński, L. J.	HQ-EZ	Melia, F.	NAGW 1609	3009
11	OHIO STATE UNIV	Kondo, Y.	GSFC	Ferland, G. J.	NAG 5-1027	5039
11	PENN STATE U-UNIV PK	Pollack, J. B.	ARC	Ackerman, T. P.	NCA 2-335	5352
11	PENN STATE U-UNIV PK	Early, L. J.	GSFC	Garmire, G. P.	NAG 5-100	5306
11	PENN STATE U-UNIV PK	Klinglesmith, D. A.	GSFC	Usher, P. D.	NAG 5-361	5308
11	PENN STATE U-UNIV PK	Kondo, Y.	GSFC	Ramsey, L. W.	NAG 5-563	5309
11	PENN STATE U-UNIV PK	Kondo, Y.	GSFC	McCluskey, C.	NAG 5-1107	5317
11	PENN STATE U-UNIV PK	West, D.	GSFC	Nousek, J.	NAG 5-1211	5319
11	PENN STATE U-UNIV PK	West, D.	GSFC	Feigelson, E. D.	NAG 5-1212	5320
11	PENN STATE U-UNIV PK	Potter, P. V.	MSFC	Burrows, D.	NAG 8-601	5322
11	PENN STATE U-UNIV PK	Harper, B.	MSFC	Meszaros, P. I.	NAG 8-672	5323
11	PENN STATE U-UNIV PK	Havrisik, D.	MSFC	Nousek, J. A.	NAG 8-758	5325
11	PENN STATE U-UNIV PK	Cummings, N. P.	MSFC	Garmire, G. P.	NAS 8-36749	5344
11	PENN STATE U-UNIV PK	Kaluziński, L. J.	HQ-EZ	Meszaros, P. I.	NAGW 1522	5338
11	PENN STATE U-UNIV PK	Weiss, J. R.	HQ-EZ	Nousek, J.	NAGW 1713	5339
11	PENN STATE U-UNIV PK	Owens, F. C.	HQ-XE	Garmire, G. P.	NGT 00-050-309	5362
11	PRINCETON UNIVERSITY	Kondo, Y.	GSFC	Jenkins, E. B.	NAG 5-1004	4335
11	PRINCETON UNIVERSITY	Kondo, Y.	GSFC	Fitzpatrick, E. L.	NAG 5-1014	4336
11	PRINCETON UNIVERSITY	West, D.	GSFC	Knapp, G. R.	NAG 5-1226	4337
11	PRINCETON UNIVERSITY	Kniffen, D. A.	GSFC	Taylor, J. H.	NAG 5-1258	4338
11	PRINCETON UNIVERSITY	Mather, J.	GSFC	Wilkenson, D. T.	NAS 5-27590	4350
11	PRINCETON UNIVERSITY	Kalinowski, K.	GSFC	Groth, E. J.	NAS 5-29142	4351
11	PRINCETON UNIVERSITY	Vitaglino, D.	GSFC	Jenkins, E.	NAS 5-30110	4352
11	PRINCETON UNIVERSITY	Kondo, Y.	GSFC	Jenkins, E. B.	NSG 5248	4364
11	PRINCETON UNIVERSITY	Boggess, N. W.	HQ-EZ	Wilkinson, D.	NAGW 445	4341
11	PRINCETON UNIVERSITY	Stencel, R. E.	HQ-EZ	Rogerson Jr., J. B.	NAGW 477	4342
11	PRINCETON UNIVERSITY	Clayton, G.	HQ-EZ	Ostriker, J. P.	NAGW 765	4343
11	PRINCETON UNIVERSITY	Gillett, F. C.	HQ-EZ	Draine, B. T.	NGL 31-001-007	4356
11	PRINCETON UNIVERSITY	Boggess, N. W.	HQ-EZ	Wilkinson, D. T.	NSG 7302	4365
11	RENSSELAER POLY-NY	West, D.	GSFC	Leung, C. M.	NAG 5-1182	4637
11	RENSSELAER POLY-NY	Bergstrahl, J. T.	HQ-EL	Ferris, J. P.	NAGW 476	4638
11	RENSSELAER POLY-NY	Quaide, W. L.	HQ-EL	Gaffey, M. J.	NAGW 1372	4642
11	RENSSELAER POLY-NY	Gillett, F. C.	HQ-EZ	Leung, C.	NAGW 1103	4640
11	RICE UNIVERSITY	Lasher, L. E.	ARC	Cloutier, P. A.	NAG 2-566	5577
11	RICE UNIVERSITY	Kondo, Y.	GSFC	Dufour, R. J.	NAG 5-262	5579
11	RICE UNIVERSITY	Browne, I. D.	JSC	Clayton, D. D.	NAG 9-100	5585
11	RICE UNIVERSITY	Potter, A.	JSC	Killen, R. M.	NAG 9-305	5591
11	RICE UNIVERSITY	Gooding, J. L.	JSC	O'dell, C. R.	NAG 9-358	5593
11	RICE UNIVERSITY	Robinson, M. B.	MSFC	Margrave, J. L.	NAG 8-612	5582
11	RICE UNIVERSITY	Rosendhal, J. D.	HQ-E	Michel, F. C.	NAGW 379	5597
11	RICE UNIVERSITY	Bergstrahl, J. T.	HQ-EL	Killen, R.	NAGW 1628	5601
11	RUTGERS ST U-N BRNSK	Browne, I. D.	JSC	Herzog, G. F.	NAG 9-26	4367
11	SAN DIEGO STATE UNIV	Gillett, F. C.	HQ-EZ	Lee, L.	NAGW 319	1630
11	SAN FRAN STATE UNIV	Valero, F. P.	ARC	Marcy, G. W.	NCA 2-261	1636
11	SONOMA STATE UNIV	Harper, B.	MSFC	Cominsky, L. R.	NAG 8-649	1687
11	STANFORD UNIVERSITY	Lasher, L. E.	ARC	Carpenter, D. L.	NAG 2-520	1703
11	STANFORD UNIVERSITY	Scargle, J. D.	ARC	Timothy, J. G.	NCA 2-93	1758
11	STANFORD UNIVERSITY	Pollack, J. B.	ARC	Sleep, N.	NCA 2-263	1769
11	STANFORD UNIVERSITY	Cuzzi, J. N.	ARC	Tyler, G. L.	NCA 2-283	1773
11	STANFORD UNIVERSITY	Barnes, A.	ARC	Owen Storey, L. R.	NCA 2-286	1775
11	STANFORD UNIVERSITY	Brooks, W. F.	ARC	Lusignan, B.	NCA 2-393	1793
11	STANFORD UNIVERSITY	Young, R. E.	ARC	Tyler, G. L.	NCA 2-396	1794
11	STANFORD UNIVERSITY	Hartman, R. C.	GSFC	Hofstadter, R.	NAS 5-27557	1747
11	STANFORD UNIVERSITY	Nein, M.	MSFC	Yearian, M. R.	NAG 8-752	1721
11	STANFORD UNIVERSITY	Fishman, G. J.	MSFC	Inan, U. S.	NAG 8-778	1723
11	STANFORD UNIVERSITY	Quaide, W. L.	HQ-EL	Eshelman, V. R.	NAGW 1180	1736
11	STANFORD UNIVERSITY	Quaide, W. L.	HQ-EL	Tyler, G. L.	NAGW 1210	1737

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FIELD CODE	INSTITUTION	TECHNICAL OFFICER	TECH OFF LOC	FIRST PRINCIPAL INVESTIGATOR	AGREEMENT NUMBER	ACC NO.
11	STANFORD UNIVERSITY	Mahaffy, P.	HQ-EL	Tyler, G. L.	NASW 3981	1755
11	STANFORD UNIVERSITY	Bohlin, J. D.	HQ-ES	Scherrer, P. H.	NGR 05-020-559	1836
11	STANFORD UNIVERSITY	Bohlin, J. D.	HQ-ES	Petrosian, V.	NSG 7092	1860
11	STANFORD UNIVERSITY	Clayton, G. C.	HQ-EZ	Wagoner, R. V.	NAGW 299	1729
11	STANFORD UNIVERSITY	Kaluzienski, L. J.	HQ-EZ	Sturrock, P. A.	NGR 05-020-668	1838
11	STATE UNIV NY-ALBANY	Haughney, L. C.	ARC	Knacke, R.	NAG 2-495	4657
11	STATE UNIV NY-ALBANY	Lasher, L. E.	ARC	Fox, J. L.	NAG 2-523	4658
11	STATE U NY-BINGHAMTN	Owens, F. C.	HQ-LE	Goel, N. S.	NGT 33-188-805	4683
11	STATE U NY-STONY BRK	West, D.	GSFC	Wagener, R.	NAG 5-1083	4706
11	STATE U NY-STONY BRK	West, D.	GSFC	Yahil, A.	NAG 5-1228	4708
11	STATE U NY-STONY BRK	West, D.	GSFC	Solomon, P. M.	NAG 5-1231	4709
11	STATE U NY-STONY BRK	West, D. K.	GSFC	Walter, F. M.	NAG 5-1279	4710
11	STATE U NY-STONY BRK	West, D.	GSFC	Walter, F. M.	NAG 5-1280	4711
11	STATE U NY-STONY BRK	Taylor, W. E.	MSFC	Caldwell, J. J.	NAS 8-32904	4722
11	STATE U NY-STONY BRK	Rahe, J. H.	HQ-EL	Knacke, R.	NAGW 1481	4718
11	STATE U NY-STONY BRK	Rahe, J. H.	HQ-EL	Owen, T.	NAGW 1543	4720
11	STATE U NY-STONY BRK	Brinton, H. C.	HQ-EL	Owen, T. C.	NGR 33-015-141	4726
11	STATE U NY-STONY BRK	Brinton, H. C.	HQ-EL	Knacke, R. F.	NSG 7286	4730
11	STATE U NY-STONY BRK	Owens, F. C.	HQ-LE	Knacke, R.	NGT 33-015-803	4727
11	SWARTHMORE COLLEGE	West, D. K.	GSFC	Gaustad, J. E.	NAG 5-1152	5375
11	TENNESSEE STATE UNIV	Randall, J. L.	MSFC	Busby, M. R.	NAG 8-111	5500
11	UNIV ALA-HUNTSVILLE	Davis, J. M.	MSFC	Emslie, A. G.	NAG 8-52	1093
11	UNIV ALA-HUNTSVILLE	Waite, J. H.	MSFC	Comfort, R. H.	NAG 8-82	1101
11	UNIV ALA-HUNTSVILLE	Bilbro, J. W.	MSFC	Chipman, R. A.	NAG 8-135	1116
11	UNIV ALA-HUNTSVILLE	Snyder, R. S.	MSFC	Alexander, J. I.	NAG 8-759	1135
11	UNIV ALA-HUNTSVILLE	Fishman, G. J.	MSFC	Paciesas, W. S.	NAS 8-36362	1159
11	UNIV ALA-UNIVERSITY	West, D.	GSFC	White, R. E.	NAG 5-1188	1191
11	UNIV ALA-UNIVERSITY	West, D.	GSFC	Keel, W. C.	NAG 5-1283	1192
11	UNIV ALASKA-FAIRBNKS	Trofford, G. H.	GSFC	Miller, J.	NCA 5-112	1222
11	UNIV ALASKA-FAIRBNKS	Mellott, M. M.	HQ-ES	Rees, M. H.	NAGW 1573	1215
11	UNIV OF ARIZONA	Haughney, L. C.	ARC	Larson, H. P.	NAG 2-206	1290
11	UNIV OF ARIZONA	Ramos, R.	ARC	Low, F. J.	NAG 2-319	1291
11	UNIV OF ARIZONA	Ramos, R.	ARC	Rieke, G.	NAG 2-320	1292
11	UNIV OF ARIZONA	Goorvitch, D.	ARC	Low, F. J.	NAG 2-447	1296
11	UNIV OF ARIZONA	Lasher, L. E.	ARC	Bougher, S. W.	NAG 2-519	1297
11	UNIV OF ARIZONA	Cuzzi, J. N.	ARC	Larson, S. M.	NAG 2-527	1298
11	UNIV OF ARIZONA	Cuzzi, J. N.	ARC	Hood, L. L.	NAG 2-576	1300
11	UNIV OF ARIZONA	Haughney, L. C.	ARC	Rieke, M.	NAS 2-12498	1417
11	UNIV OF ARIZONA	Ramos, R.	ARC	Rieke, G.	NAS 2-12578	1418
11	UNIV OF ARIZONA	Stoker, C.	ARC	Fink, U.	NCA 2-405	1432
11	UNIV OF ARIZONA	Nishioka, K.	ARC	Levy, E. H.	NCC 2-439	1435
11	UNIV OF ARIZONA	Kondo, Y.	GSFC	Green, R.	NAG 5-38	1307
11	UNIV OF ARIZONA	Kondo, Y.	GSFC	Holbert, J. B.	NAG 5-434	1309
11	UNIV OF ARIZONA	Kondo, Y.	GSFC	Polidan, R. S.	NAG 5-441	1310
11	UNIV OF ARIZONA	West, D.	GSFC	Shemansky, D.	NAG 5-560	1312
11	UNIV OF ARIZONA	Kondo, Y.	GSFC	Wade, R. A.	NAG 5-703	1315
11	UNIV OF ARIZONA	Trombka, J. I.	GSFC	Boynton, W. V.	NAG 5-790	1316
11	UNIV OF ARIZONA	Kondo, Y.	GSFC	Berriman, G.	NAG 5-953	1321
11	UNIV OF ARIZONA	West, D.	GSFC	Liebert, J. W.	NAG 5-965	1322
11	UNIV OF ARIZONA	West, D. K.	GSFC	Carone, T. E.	NAG 5-1142	1323
11	UNIV OF ARIZONA	West, D.	GSFC	Carone, T. E.	NAG 5-1191	1324
11	UNIV OF ARIZONA	West, D.	GSFC	Young, E. T.	NAG 5-1221	1325
11	UNIV OF ARIZONA	West, D.	GSFC	Shemansky, D. E.	NAG 5-1222	1326
11	UNIV OF ARIZONA	West, D.	GSFC	Rieke, G. H.	NAG 5-1234	1327
11	UNIV OF ARIZONA	West, D.	GSFC	Impey, C.	NAG 5-1235	1328
11	UNIV OF ARIZONA	West, D.	GSFC	Lada, C. J.	NAG 5-1237	1330
11	UNIV OF ARIZONA	West, D.	GSFC	Low, F. J.	NAG 5-1252	1331
11	UNIV OF ARIZONA	Ferrante, J.	LERC	Schlosser, H.	NAG 2-161	1289
11	UNIV OF ARIZONA	Harper, B. A.	MSFC	Liebert, J.	NAG 8-666	1333
11	UNIV OF ARIZONA	Harper, B. A.	MSFC	Rieke, G. H.	NAG 8-667	1334

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11	UNIV OF ARIZONA	Snyder, R. S.	MSFC	Sammons, D. W.	NAG 8-716	1336
11	UNIV OF ARIZONA	Brinton, H. C.	HQ-EL	Larson, S. M.	NAGW 247	1345
11	UNIV OF ARIZONA	Brinton, H. C.	HQ-EL	Hunter, D. M.	NAGW 596	1353
11	UNIV OF ARIZONA	Brinton, H. C.	HQ-EL	Drummond, J. D.	NAGW 867	1361
11	UNIV OF ARIZONA	Brinton, H. C.	HQ-EL	Gehrels, T.	NAGW 887	1362
11	UNIV OF ARIZONA	Rahe, J. H.	HQ-EL	Greenberg, R. J.	NAGW 1132	1375
11	UNIV OF ARIZONA	Quaide, W. L.	HQ-EL	Holberg, J. B.	NAGW 1184	1380
11	UNIV OF ARIZONA	Brinton, H. C.	HQ-EL	McMillan, R. S.	NAGW 1283	1388
11	UNIV OF ARIZONA	Brinton, H. C.	HQ-EL	Gehrels, T.	NAGW 1300	1390
11	UNIV OF ARIZONA	Rahe, J. H.	HQ-EL	Singer, R. B.	NAGW 1408	1397
11	UNIV OF ARIZONA	Quaide, W. L.	HQ-EL	Lebofsky, L. A.	NAGW 1443	1400
11	UNIV OF ARIZONA	Bergstrahl, J. T.	HQ-EL	Herbert, F.	NAGW 1498	1402
11	UNIV OF ARIZONA	Rahe, J. H.	HQ-EL	Drummond, J. D.	NAGW 1511	1403
11	UNIV OF ARIZONA	Rahe, J. H.	HQ-EL	Fink, U.	NAGW 1549	1404
11	UNIV OF ARIZONA	Rahe, J. H.	HQ-EL	Hubbard, W. B.	NAGW 1555	1405
11	UNIV OF ARIZONA	Rahe, J. H.	HQ-EL	Smith, B. A.	NAGW 1602	1406
11	UNIV OF ARIZONA	Quaide, W.	HQ-EL	Boynton, W.	NAGW 1776	1415
11	UNIV OF ARIZONA	Brinton, H. C.	HQ-EL	Hsieh, K. C.	NASW 3627	1426
11	UNIV OF ARIZONA	Brinton, H. C.	HQ-EL	Smith, B. A.	NGL 03-002-002	1438
11	UNIV OF ARIZONA	Brinton, H. C.	HQ-EL	Taylor, R. C.	NGL 03-002-081	1439
11	UNIV OF ARIZONA	Brinton, H. C.	HQ-EL	Hubbard, W. B.	NSG 7045	1473
11	UNIV OF ARIZONA	Brinton, H. C.	HQ-EL	Fink, U. W.	NSG 7070	1474
11	UNIV OF ARIZONA	Brinton, H. C.	HQ-EL	Lebofsky, L. A.	NSG 7114	1476
11	UNIV OF ARIZONA	Mellott, M. M.	HQ-ES	White, S. D.	NAGW 763	1359
11	UNIV OF ARIZONA	Ahluwalia, H. S.	HQ-ES	Gehrels, T.	NASW 4389	1429
11	UNIV OF ARIZONA	Mellott, M. M.	HQ-ES	Jokipii, J. R.	NSG 7101	1475
11	UNIV OF ARIZONA	Stachnik, R. V.	HQ-EZ	Rieke, M.	NAGW 520	1350
11	UNIV OF ARIZONA	Clayton, G. C.	HQ-EZ	Holberg, J.	NAGW 587	1352
11	UNIV OF ARIZONA	Clayton, G.	HQ-EZ	McGraw, J. T.	NAGW 804	1360
11	UNIV OF ARIZONA	Gillett, F. C.	HQ-EZ	Young, E.	NAGW 1285	1389
11	UNIV OF ARIZONA	Gillett, F. C.	HQ-EZ	Hogan, C. J.	NAGW 1703	1410
11	UNIV OF ARIZONA	Gillett, F. C.	HQ-EZ	Hoffman, W. F.	NAGW 1725	1413
11	UNIV OF ARIZONA	Boggess, N. W.	HQ-EZ	Low, F. J.	NASW 3703	1427
11	UNIV OF ARIZONA	Caroff, L. J.	HQ-EZ	Low, F. J.	NGR 03-002-269	1440
11	UNIV OF ARIZONA	Stachnik, R. V.	HQ-EZ	Hoffmann, W.	NGR 03-002-371	1441
11	UNIV OF ARIZONA	West, D.	HQ-	Sykes, M. V.	NAG 5-1236	1329
11	UNIV OF ARIZONA	Owens, F. C.	HQ-XE	Lewis, J. S.	NGT 00-050-186	1450
11	UNIV OF ARIZONA	Owens, F. C.	HQ-XE	Martin	NGT 00-050-319	1460
11	UNIV OF ARIZONA	Owens, F. C.	HQ-XE	Green, R.	NGT 00-050-331	1461
11	UNIV OF ARIZONA	Owens, F. C.	HQ-LE	Lewis, J. S.	NGT 03-002-803	1468
11	UNIV OF ARIZONA	Owens, F. C.	HQ-LE	Lebofsky, M. J.	NGT 03-002-805	1469
11	UNIV OF ARIZONA	Owens, F. C.	HQ-LE	Rieke, G.	NGT 03-002-807	1470
11	UNIV CALIF-BERKELEY	Haughney, L. C.	ARC	Townes, C. H.	NAG 2-208	1862
11	UNIV CALIF-BERKELEY	Haughney, L. C.	ARC	Betz, A. L.	NAG 2-254	1864
11	UNIV CALIF-BERKELEY	Lasher, L. E.	ARC	Anderson, K.	NAG 2-393	1866
11	UNIV CALIF-BERKELEY	Cassen, P.	ARC	Shu, F. H.	NCA 2-64	1938
11	UNIV CALIF-BERKELEY	Hollenbach, D.	ARC	McKee, C.	NCA 2-67	1939
11	UNIV CALIF-BERKELEY	Hollenbach, D.	ARC	McKee, C.	NCA 2-126	1940
11	UNIV CALIF-BERKELEY	Werner, M.	ARC	Spinrad, H.	NCA 2-227	1944
11	UNIV CALIF-BERKELEY	Allamandola, L. J.	ARC	McKee, C.	NCA 2-270	1947
11	UNIV CALIF-BERKELEY	Hollenbach, D.	ARC	McKee, C.	NCA 2-277	1949
11	UNIV CALIF-BERKELEY	Werner, M. W.	ARC	Cohen, M.	NCA 2-279	1950
11	UNIV CALIF-BERKELEY	Valero, F. P.	ARC	Davis, S. P.	NCA 2-334	1953
11	UNIV CALIF-BERKELEY	Cuzzi, J. N.	ARC	Shu, F. H.	NCA 2-412	1955
11	UNIV CALIF-BERKELEY	Wittenborn, F. C.	ARC	Heiles, C. E.	NCC 2-142	1962
11	UNIV CALIF-BERKELEY	Hollenbach, D. J.	ARC	Shu, F. H.	NCC 2-548	1964
11	UNIV CALIF-BERKELEY	Kondo, Y.	GSFC	Basri, G. S.	NAG 5-576	1878
11	UNIV CALIF-BERKELEY	West, D.	GSFC	Basri, G.	NAG 5-1062	1884
11	UNIV CALIF-BERKELEY	Ormes, J. F.	GSFC	Smoot, G. F.	NAG 5-1123	1885
11	UNIV CALIF-BERKELEY	West, D. K.	GSFC	Davis, M.	NAG 5-1170	1886

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11	UNIV CALIF-BERKELEY	West, D. K.	GSFC	Filippenko, A. V.	NAG 5-1171	1887
11	UNIV CALIF-BERKELEY	West, D.	GSFC	Heiles, C.	NAG 5-1230	1888
11	UNIV CALIF-BERKELEY	West, D.	GSFC	Shu, F.	NAG 5-1243	1889
11	UNIV CALIF-BERKELEY	Mather, J. C.	GSFC	Smoot, G. F.	NAS 5-27592	1926
11	UNIV CALIF-BERKELEY	Kalinowski, J. K.	GSFC	King, I.	NAS 5-28086	1927
11	UNIV CALIF-BERKELEY	Schultz, D.	GSFC	Malina, R.	NAS 5-29298	1928
11	UNIV CALIF-BERKELEY	Smith, A.	GSFC	Hunten, D.	NAS 5-30180	1929
11	UNIV CALIF-BERKELEY	Early, L. J.	GSFC	Bowyer, C. S.	NGR 05-003-450	1971
11	UNIV CALIF-BERKELEY	O'neal, R. L.	LARC	Price, P. B.	NAS 1-17806	1922
11	UNIV CALIF-BERKELEY	Harper, B. A.	MSFC	McKee, C. F.	NAG 8-679	1891
11	UNIV CALIF-BERKELEY	Harper, B. A.	MSFC	Kahn, S. M.	NAG 8-680	1892
11	UNIV CALIF-BERKELEY	Alexander, J. K.	HQ-E	McKee, C. F.	NAGW 1672	1918
11	UNIV CALIF-BERKELEY	Rummel, J. D.	HQ-EB	Bowyer, C. S.	NAGW 526	1899
11	UNIV CALIF-BERKELEY	Brinton, H. C.	HQ-EL	Spinrad, H.	NAGW 270	1896
11	UNIV CALIF-BERKELEY	Bergstralh, J. T.	HQ-EL	Lin, R. P.	NAGW 1298	1908
11	UNIV CALIF-BERKELEY	Bergstralh, J. T.	HQ-EL	Depater, I.	NAGW 1805	1921
11	UNIV CALIF-BERKELEY	Mellott, M. M.	HQ-ES	Price, P. B.	NGR 05-003-376	1970
11	UNIV CALIF-BERKELEY	Mellott, M. M.	HQ-ES	Crawford, H. J.	NGR 05-003-513	1973
11	UNIV CALIF-BERKELEY	Gillett, F. C.	HQ-EZ	Smoot, G. F.	NAGW 66	1894
11	UNIV CALIF-BERKELEY	Jones, W. V.	HQ-EZ	Price, P. B.	NAGW 868	1903
11	UNIV CALIF-BERKELEY	Clayton, G. C.	HQ-EZ	Siegmund, O. H.	NAGW 1290	1907
11	UNIV CALIF-BERKELEY	Gillett, F. C.	HQ-EZ	Richards, P. L.	NAGW 1352	1910
11	UNIV CALIF-BERKELEY	Kaluzienski, L. J.	HQ-EZ	Hurley, K. C.	NAGW 1513	1912
11	UNIV CALIF-BERKELEY	Gillett, F. C.	HQ-EZ	Lange, A. E.	NAGW 1597	1916
11	UNIV CALIF-BERKELEY	Weiss, J. R.	HQ-EZ	Chakabarti, S.	NAGW 1735	1919
11	UNIV CALIF-BERKELEY	Weiler, E. J.	HQ-EZ	Lampton, M. L.	NASW 4099	1936
11	UNIV CALIF-BERKELEY	Gillett, F. C.	HQ-EZ	Silk, J. I.	NGR 05-003-578	1974
11	UNIV CALIF-BERKELEY	Gillett, F. C.	HQ-EZ	Richards, P. L.	NSG 7205	1998
11	UNIV CALIF-BERKELEY	Owens, F. C.	HQ-XE	Bowyer, C. S.	NGT 00-050-185	1983
11	UNIV CALIF-DAVIS	Brinton, H. C.	HQ-EL	Jackson, W. M.	NAGW 1144	2015
11	UNIV CALIF-L ANGELES	Ramos, R.	ARC	Jura, M. A.	NAG 2-313	2062
11	UNIV CALIF-L ANGELES	Ramos, R.	ARC	Wright, E. L.	NAG 2-315	2063
11	UNIV CALIF-L ANGELES	Fimmel, R. O.	ARC	Strangeway, R. J.	NAG 2-485	2067
11	UNIV CALIF-L ANGELES	Lasher, L. E.	ARC	Russell, C.	NAG 2-501	2068
11	UNIV CALIF-L ANGELES	Craig, R. A.	ARC	Russell, C. T.	NAS 2-12383	2124
11	UNIV CALIF-L ANGELES	Erickson, E.	ARC	Zuckerman, B.	NCA 2-180	2133
11	UNIV CALIF-L ANGELES	Young, R. E.	ARC	Schubert, G.	NCA 2-246	2134
11	UNIV CALIF-L ANGELES	Erickson, E. F.	ARC	Zuckerman, B.	NCA 2-373	2139
11	UNIV CALIF-L ANGELES	Erickson, E. F.	ARC	Morris, M.	NCA 2-394	2141
11	UNIV CALIF-L ANGELES	Pollack, J. B.	ARC	Quest, K. B.	NCA 2-400	2142
11	UNIV CALIF-L ANGELES	Kondo, Y.	GSFC	Malkan, M. A.	NAG 5-575	2076
11	UNIV CALIF-L ANGELES	Kondo, Y.	GSFC	Aller, L.	NAG 5-1063	2081
11	UNIV CALIF-L ANGELES	Kondo, Y.	GSFC	Jura, M.	NAG 5-1085	2083
11	UNIV CALIF-L ANGELES	Poland, A. I.	GSFC	Ulrich, R. K.	NAG 5-1166	2085
11	UNIV CALIF-L ANGELES	West, D.	GSFC	Aller, L. H.	NAG 5-1207	2087
11	UNIV CALIF-L ANGELES	West, D.	GSFC	Zuckerman, B. M.	NAG 5-1208	2088
11	UNIV CALIF-L ANGELES	Mather, J. C.	GSFC	Wright, E. L.	NAS 5-27670	2128
11	UNIV CALIF-L ANGELES	Vitagliano, H. D.	GSFC	Jura, M.	NAS 5-29363	2130
11	UNIV CALIF-L ANGELES	Crosby, D.	GSFC	Russell, C. T.	NAS 5-30373	2131
11	UNIV CALIF-L ANGELES	West, D.	GSFC	Plavec, M. J.	NSG 5272	2161
11	UNIV CALIF-L ANGELES	Underwood, J. R.	HQ-EL	Nicol, M. F.	NAGW 104	2099
11	UNIV CALIF-L ANGELES	Gillett, F. C.	HQ-EZ	Jura, M. A.	NAGW 80	2097
11	UNIV CALIF-L ANGELES	Owens, F. C.	HQ-XE	Malkan, M.	NGT 00-070-039	2154
11	UNIV CALIF-RIVERSIDE	Bergstralh, J. T.	HQ-EL	White, R. S.	NAGW 709	2164
11	UNIV CALIF-RIVERSIDE	Kaluzienski, L. J.	HQ-EZ	White, R. S.	NGR 05-008-022	2165
11	UNIV CALIF-SAN DIEGO	McCreight, C. R.	ARC	Puetter, R. C.	NAG 2-580	2173
11	UNIV CALIF-SAN DIEGO	West, D.	GSFC	Junkkarinen, V.	NAG 5-1209	2188
11	UNIV CALIF-SAN DIEGO	West, D.	GSFC	Tucker, W.	NAG 5-1210	2189
11	UNIV CALIF-SAN DIEGO	Shannon, J. L.	GSFC	Harms, R. J.	NAS 5-24463	2231
11	UNIV CALIF-SAN DIEGO	Shannon, J. L.	GSFC	Beaver, E. A.	NAS 5-25054	2232

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11	UNIV CALIF-SAN DIEGO	Vitagliano, A. D.	GSFC	Beaver, E. A.	NAS 5-30107	2236
11	UNIV CALIF-SAN DIEGO	Muller, R.	GSFC	Matteson, J. L.	NAS 5-30338	2237
11	UNIV CALIF-SAN DIEGO	Vilas, F.	JSC	McFadden, L. A.	NAG 9-353	2203
11	UNIV CALIF-SAN DIEGO	Havrisik, D. M.	MSFC	Gruber, D. F.	NAG 8-499	2191
11	UNIV CALIF-SAN DIEGO	Harper, B.	MSFC	Gruber, D. E.	NAG 8-663	2193
11	UNIV CALIF-SAN DIEGO	Harper, B.	MSFC	Gruben, D. E.	NAG 8-739	2194
11	UNIV CALIF-SAN DIEGO	Dabbs, J. R.	MSFC	Hudson, H. S.	NAG 8-742	2195
11	UNIV CALIF-SAN DIEGO	Dabbs, J. R.	MSFC	Hudson, H. S.	NAG 8-773	2196
11	UNIV CALIF-SAN DIEGO	Schrick, B. J.	MSFC	Matteson, J. L.	NAS 8-36081	2240
11	UNIV CALIF-SAN DIEGO	Bergstrahl, J. T.	HQ-EL	Mendis, D. A.	NAGW 1502	2224
11	UNIV CALIF-SAN DIEGO	Fox, K.	HQ-EL	Mendis, D. A.	NGR 05-009-110	2252
11	UNIV CALIF-SAN DIEGO	Kaluzienski, L. J.	HQ-EZ	Matteson, J. L.	NAGW 449	2205
11	UNIV CALIF-SAN DIEGO	Kaluzienski, L. J.	HQ-EZ	Gruber, D. E.	NAGW 1399	2223
11	UNIV CALIF-SAN DIEGO	Clayton, G. C.	HQ-EZ	Hudson, H.	NAGW 1523	2225
11	UNIV CALIF-SAN DIEGO	Weiler, E. J.	HQ-EZ	Hier, R. G.	NASW 3667	2242
11	UNIV CALIF-SAN DIEGO	Kaluzienski, L. J.	HQ-EZ	Gould, R. J.	NGL 05-005-004	2250
11	UNIV CALIF-SAN DIEGO	Kaluzienski, L. J.	HQ-EZ	Lingenfelter, R. E.	NSG 7541	2265
11	UNIV CALIF-S BARBARA	Gillett, F. C.	HQ-EZ	Lubin, P. M.	NAGW 1062	2295
11	UNIV CALIF-S CRUZ	Witteborn, F. C.	ARC	Rank, D. M.	NCA 2-152	2315
11	UNIV CALIF-S CRUZ	Cassen, P. M.	ARC	Lin, D. N.	NCA 2-200	2316
11	UNIV CALIF-S CRUZ	Cuzzi, J. N.	ARC	Lin, N. C.	NCA 2-312	2319
11	UNIV CALIF-S CRUZ	Scargle, J. D.	ARC	Lin, D. N.	NCA 2-347	2320
11	UNIV CALIF-S CRUZ	Scargle, J. D.	ARC	Nelson, H. F.	NCA 2-348	2321
11	UNIV CALIF-S CRUZ	Erickson, E. F.	ARC	Rank, D. M.	NCA 2-355	2322
11	UNIV CALIF-S CRUZ	Witteborn, F. C.	ARC	Rank, D. M.	NCA 2-399	2323
11	UNIV CALIF-S CRUZ	Pollack, J. B.	ARC	Bodenheimer, P. H.	NCA 2-432	2325
11	UNIV CALIF-S CRUZ	Witteborn, F. C.	ARC	Rank, D. M.	NCC 2-485	2326
11	UNIV CALIF-S CRUZ	Hollenbach, D. J.	ARC	Lin, D. N.	NCC 2-544	2328
11	UNIV CALIF-S CRUZ	Rahe, J. H.	HQ-EL	Klemola, A. R.	NAGW 1525	2313
11	UNIV CALIF-S CRUZ	Gillett, F. C.	HQ-EZ	Lin, D. N.	NAGW 1102	2310
11	UNIV CALIF-S CRUZ	Owens, F. C.	HQ-XE	Lin, D. N.	NGT 00-050-281	2329
11	UNIV OF CHICAGO	Smith, B. F.	ARC	Miller, R. H.	NCC 2-265	3066
11	UNIV OF CHICAGO	Haughney, L. C.	ARC	Harper, D. A., Jr.	NGR 14-001-227	3073
11	UNIV OF CHICAGO	Haughney, L. C.	ARC	Hildebrand, R. H.	NSG 2057	3092
11	UNIV OF CHICAGO	Kondo, Y.	GSFC	Hobbs, L.	NAG 5-255	3022
11	UNIV OF CHICAGO	Wales, R. O.	GSFC	Simpson, J. A.	NAG 5-706	3026
11	UNIV OF CHICAGO	Kondo, Y.	GSFC	York, D. G.	NAG 5-1005	3028
11	UNIV OF CHICAGO	Wales, R. O.	GSFC	Meyer, P. O.	NAG 5-1086	3030
11	UNIV OF CHICAGO	West, D.	GSFC	Lamb, D. Q.	NAG 5-1177	3031
11	UNIV OF CHICAGO	West, D.	GSFC	Rosner, R.	NAG 5-1259	3032
11	UNIV OF CHICAGO	Wales, R. O.	GSFC	Simpson, J. A.	NAS 5-30117	3063
11	UNIV OF CHICAGO	Browne, I. D.	JSC	Clayton, R. N.	NAG 9-51	3035
11	UNIV OF CHICAGO	Harper, B. A.	MSFC	Lamb, D. Q.	NAG 8-732	3033
11	UNIV OF CHICAGO	Butler, D. M.	HQ-EE	Rosner, R.	NAGW 1235	3046
11	UNIV OF CHICAGO	Mahaffy, P. R.	HQ-EL	Tuzzolino, A. J.	NAGW 1757	3059
11	UNIV OF CHICAGO	Ahluwalia, H. S.	HQ-ES	Parker, E. N.	NGL 14-001-001	3067
11	UNIV OF CHICAGO	Mellott, M. M.	HQ-ES	Meyer, P.	NGL 14-001-005	3068
11	UNIV OF CHICAGO	Mellott, M. M.	HQ-ES	Simpson, J. A.	NGL 14-001-006	3069
11	UNIV OF CHICAGO	Kaluzienski, L. J.	HQ-EZ	Lamb, D. Q., Jr.	NAGW 830	3043
11	UNIV OF CHICAGO	Clayton, G. C.	HQ-EZ	Schramm, D. N.	NAGW 1321	3049
11	UNIV OF CHICAGO	Kaluzienski, L. J.	HQ-EZ	Konigl, A.	NAGW 1636	3054
11	UNIV OF CHICAGO	Clayton, G. C.	HQ-EZ	York, D. G.	NAGW 1715	3058
11	UNIV OF CHICAGO	Weiler, E. J.	HQ-EZ	Hobbs, L. M.	NGR 14-001-147	3072
11	UNIV OF CHICAGO	Owens, F. C.	HQ-XE	Lamb, D. Q.	NGT 00-050-189	3079
11	UNIV OF CHICAGO	Owens, F. C.	HQ-LE	Hildebrand, R.	NGT 00-050-073	3077
11	UNIV OF CINCINNATI	Kondo, Y.	GSFC	Sitko, M. L.	NAG 5-872	5123
11	UNIV COLORADO-BOLDR	Lasher, L. E.	ARC	Stewart, A. I.	NAG 2-504	2411
11	UNIV COLORADO-BOLDR	Lasher, L. E.	ARC	Clancy, R. T.	NAG 2-517	2412
11	UNIV COLORADO-BOLDR	West, D.	GSFC	Garmany, K.	NAG 5-78	2417
11	UNIV COLORADO-BOLDR	Kondo, Y.	GSFC	Linsky, J. L.	NAG 5-82	2418

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11	UNIV COLORADO-BOLDR	Early, L. J.	GSFC	Cash, W. C.	NAG 5-96	2419
11	UNIV COLORADO-BOLDR	West, D.	GSFC	Shull, J. M.	NAG 5-193	2420
11	UNIV COLORADO-BOLDR	West, D.	GSFC	Ayres, T. R.	NAG 5-199	2421
11	UNIV COLORADO-BOLDR	Kondo, Y.	GSFC	Brugal, E. W.	NAG 5-350	2422
11	UNIV COLORADO-BOLDR	Osantowski, J. F.	GSFC	Cash, W. C.	NAG 5-412	2423
11	UNIV COLORADO-BOLDR	Kondo, Y.	GSFC	Walter, F. M.	NAG 5-429	2424
11	UNIV COLORADO-BOLDR	West, D. K.	GSFC	Fesen, R. A.	NAG 5-433	2425
11	UNIV COLORADO-BOLDR	Kondo, Y.	GSFC	Carpenter, K. G.	NAG 5-797	2430
11	UNIV COLORADO-BOLDR	West, D. K.	GSFC	Stocke, J. T.	NAG 5-809	2431
11	UNIV COLORADO-BOLDR	Kondo, Y.	GSFC	Stencel, R. E.	NAG 5-816	2432
11	UNIV COLORADO-BOLDR	Kondo, Y.	GSFC	Skinner, T. E.	NAG 5-817	2433
11	UNIV COLORADO-BOLDR	Kondo, Y.	GSFC	Bohannon, B.	NAG 5-833	2434
11	UNIV COLORADO-BOLDR	Kondo, Y.	GSFC	Cash, W. C.	NAG 5-948	2439
11	UNIV COLORADO-BOLDR	Kondo, Y.	GSFC	Garmany, C. D.	NAG 5-963	2441
11	UNIV COLORADO-BOLDR	Kondo, Y.	GSFC	Brown, A.	NAG 5-985	2442
11	UNIV COLORADO-BOLDR	Kondo, Y.	GSFC	McCray, R.	NAG 5-1000	2443
11	UNIV COLORADO-BOLDR	West, D.	GSFC	Conti, P. S.	NAG 5-1016	2444
11	UNIV COLORADO-BOLDR	Kondo, Y.	GSFC	Edelson, R.	NAG 5-1089	2445
11	UNIV COLORADO-BOLDR	West, D. K.	GSFC	Judge, P. G.	NAG 5-1145	2449
11	UNIV COLORADO-BOLDR	West, D. K.	GSFC	Stern, S. A.	NAG 5-1151	2450
11	UNIV COLORADO-BOLDR	West, D.	GSFC	Stencel, R. E.	NAG 5-1214	2451
11	UNIV COLORADO-BOLDR	West, D.	GSFC	Ayres, T. R.	NAG 5-1215	2452
11	UNIV COLORADO-BOLDR	West, D.	GSFC	Garmany, C. D.	NAG 5-1216	2453
11	UNIV COLORADO-BOLDR	West, D.	GSFC	Walter, F. M.	NAG 5-1217	2454
11	UNIV COLORADO-BOLDR	West, D.	GSFC	Shull, J. M.	NAG 5-1224	2455
11	UNIV COLORADO-BOLDR	West, D.	GSFC	Fesen, R. A.	NAG 5-1242	2456
11	UNIV COLORADO-BOLDR	Mead, J.	GSFC	Snow, T.	NAS 5-28731	2517
11	UNIV COLORADO-BOLDR	Vitagliano, H. D.	GSFC	Carpenter, K.	NAS 5-29337	2520
11	UNIV COLORADO-BOLDR	Vitagliano, H. D.	GSFC	Walter, F.	NAS 5-29345	2521
11	UNIV COLORADO-BOLDR	Vitagliano, H. D.	GSFC	Brandt, J. C.	NAS 5-30511	2523
11	UNIV COLORADO-BOLDR	West, D.	GSFC	Snow, T. P., Jr.	NSG 5300	2565
11	UNIV COLORADO-BOLDR	Early, L. J.	GSFC	Snow Jr., T. P.	NSG 5303	2566
11	UNIV COLORADO-BOLDR	Harper, B.	MSFC	Walter, F. M.	NAG 8-508	2457
11	UNIV COLORADO-BOLDR	Harper, B.	MSFC	Stocke, J. T.	NAG 8-575	2458
11	UNIV COLORADO-BOLDR	Harper, B.	MSFC	Edelson, R. A.	NAG 8-651	2459
11	UNIV COLORADO-BOLDR	Harper, B. A.	MSFC	Stocke, J. T.	NAG 8-658	2460
11	UNIV COLORADO-BOLDR	Harper, B. A.	MSFC	Linsky, J. L.	NAG 8-744	2461
11	UNIV COLORADO-BOLDR	Havrisik, D. M.	MSFC	Walter, F. M.	NAG 8-745	2462
11	UNIV COLORADO-BOLDR	Rahe, J. H.	HQ-EL	Brandt, J. C.	NAGW 1387	2497
11	UNIV COLORADO-BOLDR	Mahaffy, P. R.	HQ-EL	Warwick, J.	NASW 4024	2529
11	UNIV COLORADO-BOLDR	Mellott, M. M.	HQ-ES	Dulk, G. A.	NAGW 91	2464
11	UNIV COLORADO-BOLDR	Clayton, G. C.	HQ-EZ	Schull, J. M.	NAGW 766	2469
11	UNIV COLORADO-BOLDR	Kaluzienski, L. J.	HQ-EZ	Shull, J. M.	NAGW 1479	2502
11	UNIV COLORADO-BOLDR	Kaluzienski, L. J.	HQ-EZ	Linsky, J. L.	NAGW 1480	2503
11	UNIV COLORADO-BOLDR	Stachnik, R. V.	HQ-EZ	Lawrence, E.	NASW 4115	2531
11	UNIV COLORADO-BOLDR	Kaluzienski, L.	HQ-EZ	McCray, R.	NSG 7128	2567
11	UNIV COLORADO-BOLDR	Owens, F. C.	HQ-XE	Hamilton, A. J.	NGT 00-050-279	2548
11	UNIV OF DELAWARE	West, D.	GSFC	Shipman, H. L.	NAG 5-972	2618
11	UNIV OF DELAWARE	Harper, B.	MSFC	Shipman, H. L.	NAG 8-662	2619
11	UNIV OF DENVER	Goldberg, R.	GSFC	Barcus, J.	NAS 5-29311	2577
11	UNIV OF FLORIDA	Scargle, J. D.	ARC	Eichhorn, H. K.	NCA 2-325	2796
11	UNIV OF FLORIDA	Kaiser, M. L.	GSFC	Carr, T. D.	NAG 5-773	2779
11	UNIV OF FLORIDA	Mahaffy, P.	HQ-EL	Gustafson, B. A.	NAGW 1257	2783
11	UNIV OF FLORIDA	Bergstralh, J. T.	HQ-EL	Giovane, F.	NAGW 1289	2784
11	UNIV OF FLORIDA	Brunk, W. E.	HQ-EL	Weinberg, J.	NASW 3578	2791
11	UNIV OF GEORGIA	Kondo, Y.	GSFC	Caillault, J. P.	NAG 5-974	2913
11	UNIV OF GEORGIA	West, D. K.	GSFC	Shaw, J. S.	NAG 5-1148	2915
11	UNIV OF GEORGIA	West, D.	GSFC	Caillault, J. P.	NAG 5-1178	2916
11	UNIV OF HAWAII-MANOA	Haughney, L. C.	ARC	Becklin, E. E.	NAG 2-418	2923
11	UNIV OF HAWAII-MANOA	Werner, M. W.	ARC	Sellgren, K.	NCA 2-75	2972

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11	UNIV OF HAWAII-MANOA	West, D.	GSFC	Simon, T.	NAG 5-146	2925
11	UNIV OF HAWAII-MANOA	Kondo, Y.	GSFC	Cowie, L. L.	NAG 5-829	2927
11	UNIV OF HAWAII-MANOA	Kondo, Y.	GSFC	Hu, E. M.	NAG 5-993	2929
11	UNIV OF HAWAII-MANOA	West, D.	GSFC	Sanders, D. B.	NAG 5-1251	2931
11	UNIV OF HAWAII-MANOA	West, D.	GSFC	Henry, J. P.	NAG 5-1256	2932
11	UNIV OF HAWAII-MANOA	West, D.	GSFC	Hu, E.	NAG 5-1257	2933
11	UNIV OF HAWAII-MANOA	Appler, R. A.	GSFC	Hall, D. N.	NAS 5-28595	2966
11	UNIV OF HAWAII-MANOA	Appler, R.	GSFC	Hall, D. N.	NAS 5-30535	2968
11	UNIV OF HAWAII-MANOA	Harper, B.	MSFC	Cowie, L. L.	NAG 8-730	2935
11	UNIV OF HAWAII-MANOA	Harper, B. A.	MSFC	Henry, J. P.	NAG 8-738	2936
11	UNIV OF HAWAII-MANOA	Brinton, H. C.	HQ-EL	Bell, W. J.	NAGW 802	2946
11	UNIV OF HAWAII-MANOA	Brinton, H. C.	HQ-EL	Lucey, P. G.	NAGW 1299	2954
11	UNIV OF HAWAII-MANOA	Rahe, J. H.	HQ-EL	Bell, J. F.	NAGW 1383	2956
11	UNIV OF HAWAII-MANOA	Rahe, J. H.	HQ-EL	Jewitt, D. C.	NAGW 1507	2961
11	UNIV OF HAWAII-MANOA	Brinton, H.	HQ-EL	Becklin, E.	NASW 3159	2970
11	UNIV OF HAWAII-MANOA	Brinton, H.	HQ-EL	Hall, D. N.	NGF 12-001-103	2973
11	UNIV OF HAWAII-MANOA	Brinton, H. C.	HQ-EL	Hall, D. N.	NGL 12-001-057	2975
11	UNIV OF HAWAII-MANOA	Brinton, H. C.	HQ-EL	McCord, T. B.	NSG 7323	2981
11	UNIV OF HAWAII-MANOA	Gillett, F. C.	HQ-EZ	Cowie, L. L.	NAGW 959	2949
11	UNIV OF HAWAII-MANOA	Ahluwalia, H. S.	HQ-EZ	Canifield, R.	NGL 12-001-011	2974
11	UNIV ILLINOIS-URBANA	Werner, M. W.	ARC	Lamb, S. A.	NCA 2-165	3142
11	UNIV ILLINOIS-URBANA	Kondo, Y.	GSFC	Kaler, J.	NAG 5-1064	3127
11	UNIV ILLINOIS-URBANA	Kondo, Y.	GSFC	Lamb, S.	NAG 5-1110	3128
11	UNIV ILLINOIS-URBANA	West, D.	GSFC	Lamb, S. A.	NAG 5-1241	3129
11	UNIV ILLINOIS-URBANA	Brinton, H. C.	HQ-EL	Snyder, L. E.	NAGW 1131	3134
11	UNIV ILLINOIS-URBANA	Gillett, F. C.	HQ-EZ	Watson, W. D.	NAGW 1104	3133
11	UNIV ILLINOIS-URBANA	Kaluzienski, L. J.	HQ-EZ	Lamb, F. K.	NAGW 1583	3136
11	UNIV ILLINOIS-URBANA	Kaluzienski, L.	HQ-EZ	Lamb, F. K.	NSG 7653	3167
11	UNIV ILLINOIS-URBANA	Owens, F. C.	HQ-XE	Dickel, J. R.	NGT 00-050-152	3154
11	UNIV OF IOWA	Lasher, L. E.	ARC	Van Allen, J. A.	NAG 2-571	3292
11	UNIV OF IOWA	Craig, R. A.	ARC	Van Allen, J. A.	NAS 2-12327	3328
11	UNIV OF IOWA	Wales, R. O.	GSFC	Frank, L. A.	NAG 5-295	3296
11	UNIV OF IOWA	West, D.	GSFC	Fix, J. D.	NAG 5-1174	3303
11	UNIV OF IOWA	West, D.	GSFC	Molnar, L. A.	NAG 5-1175	3304
11	UNIV OF IOWA	Wainscott, F.	GSFC	Frank, L. A.	NAS 5-26858	3331
11	UNIV OF IOWA	Brinton, H. C.	HQ-EL	Neff, J. S.	NAGW 796	3306
11	UNIV OF IOWA	Clayton, G.	HQ-EZ	Fix, J. D.	NAGW 1730	3325
11	UNIV OF KANSAS	Bergstralh, J. T.	HQ-EL	Cravens, T. E.	NAGW 1588	3365
11	UNIV OF KANSAS	Clayton, G. C.	HQ-EZ	Melott, A. L.	NAGW 1288	3362
11	UNIV OF KENTUCKY	West, D.	GSFC	Clark, F. O.	NAG 5-1184	3387
11	UNIV MARYLAND-BALT	West, D.	GSFC	A'hearn, M. F.	NAG 5-1272	3504
11	UNIV MARYLAND-COL PK	Haughney, L. C.	ARC	Mundy, L. G.	NAG 2-557	3519
11	UNIV MARYLAND-COL PK	Pearl, J. C.	GSFC	Khanna, R. K.	NAG 5-216	3522
11	UNIV MARYLAND-COL PK	West, D.	GSFC	A'hearn, M. F.	NAG 5-252	3524
11	UNIV MARYLAND-COL PK	Wales, R. O.	GSFC	Ipavich, F. A.	NAG 5-705	3529
11	UNIV MARYLAND-COL PK	Jones, F. C.	GSFC	Bell, R.	NAG 5-723	3531
11	UNIV MARYLAND-COL PK	Wales, R. O.	GSFC	Gloeckler, G.	NAG 5-728	3532
11	UNIV MARYLAND-COL PK	Dwek, E.	GSFC	Trosco, J. D.	NAG 5-1039	3552
11	UNIV MARYLAND-COL PK	West, D.	GSFC	Wilson, A.	NAG 5-1079	3554
11	UNIV MARYLAND-COL PK	Kostiuk, T.	GSFC	Trasco, J. D.	NAG 5-1134	3560
11	UNIV MARYLAND-COL PK	Jones, F. C.	GSFC	Trasco, J. D.	NAG 5-1176	3562
11	UNIV MARYLAND-COL PK	West, D.	GSFC	Wilson, A. S.	NAG 5-1227	3563
11	UNIV MARYLAND-COL PK	West, D.	GSFC	Bell, R. A.	NAG 5-1249	3564
11	UNIV MARYLAND-COL PK	Dailey, C. C.	MSFC	Wilson, A. S.	NAG 8-529	3566
11	UNIV MARYLAND-COL PK	Brinton, H. C.	HQ-EL	McFadden, L.	NAGW 824	3573
11	UNIV MARYLAND-COL PK	Brinton, H. C.	HQ-EL	A'hearn, M. F.	NAGW 902	3574
11	UNIV MARYLAND-COL PK	Brinton, H. C.	HQ-EL	A'hearn, M. F.	NSG 7322	3638
11	UNIV MARYLAND-COL PK	Mellott, M. M.	HQ-ES	Earl, J. A.	NGR 21-002-066	3615
11	UNIV MARYLAND-COL PK	Mellott, M. M.	HQ-ES	Mason, G.	NGR 21-002-224	3617
11	UNIV MARYLAND-COL PK	Clayton, G. C.	HQ-EZ	Bell, R. A.	NAGW 1004	3577

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11	UNIV MARYLAND-COL PK	Owens, F. C.	HQ-XE	A'hearn, M. F.	NGT 00-050-239	3624
11	UNIV MARYLAND-COL PK	Owens, F. C.	HQ-XE	Kerr, F.	NGT 21-002-819	3630
11	UNIV OF MASS-AMHERST	Haughney, L. C.	ARC	Strom, S. E.	NAG 2-423	3901
11	UNIV OF MASS-AMHERST	Haughney, L. C.	ARC	Goldsmith, P. F.	NAG 2-540	3902
11	UNIV OF MASS-AMHERST	Rahe, J.	HQ-EC	Irrine, W. M.	NAGW 1483	3915
11	UNIV OF MASS-AMHERST	Fox, K.	HQ-EL	Schloerb, F. P.	NAGW 1405	3913
11	UNIV OF MASS-AMHERST	Rahe, J. H.	HQ-EL	Strom, S. E.	NAGW 1417	3914
11	UNIV OF MASS-AMHERST	Brinton, H. C.	HQ-EL	Irvine, W. M.	NGL 22-010-023	3920
11	UNIV MICH-ANN ARBOR	Lasher, L. E.	ARC	Donahue, T.	NAG 2-488	3986
11	UNIV MICH-ANN ARBOR	Lasher, L. E.	ARC	Nagy, A.	NAG 2-491	3987
11	UNIV MICH-ANN ARBOR	Lasher, L. E.	ARC	Fontheim, E. G.	NAG 2-518	3988
11	UNIV MICH-ANN ARBOR	Kondo, Y.	GSFC	MacAlpine, G. M.	NAG 5-552	4003
11	UNIV MICH-ANN ARBOR	Kondo, Y.	GSFC	Gaskell, C. M.	NAG 5-1001	4008
11	UNIV MICH-ANN ARBOR	West, D.	GSFC	Clarke, T. J.	NAG 5-1030	4010
11	UNIV MICH-ANN ARBOR	West, D. K.	GSFC	MacAlpine, G. M.	NAG 5-1154	4011
11	UNIV MICH-ANN ARBOR	West, D.	GSFC	Bothun, G. D.	NAG 5-1196	4013
11	UNIV MICH-ANN ARBOR	West, D.	GSFC	Clarke, J. T.	NAG 5-1197	4014
11	UNIV MICH-ANN ARBOR	West, D.	GSFC	MacAlpine, G. M.	NAG 5-1198	4015
11	UNIV MICH-ANN ARBOR	West, D.	GSFC	Bregman, J. N.	NAG 5-1268	4016
11	UNIV MICH-ANN ARBOR	Mayer, E.	GSFC	Hays, P.	NAS 5-30336	4061
11	UNIV MICH-ANN ARBOR	Jones, J. L.	LARC	Tarle, G.	NAS 1-17820	4050
11	UNIV MICH-ANN ARBOR	Potter, P. Y.	MSFC	Teske, R. G.	NAG 8-594	4017
11	UNIV MICH-ANN ARBOR	Brinton, H. C.	HQ-EL	Atreya, S. K.	NAGW 1158	4030
11	UNIV MICH-ANN ARBOR	Quaide, W. L.	HQ-EL	Atreya, S.	NAGW 1185	4031
11	UNIV MICH-ANN ARBOR	Bergstralh, J. T.	HQ-EL	Gombosi, T. I.	NAGW 1366	4035
11	UNIV MICH-ANN ARBOR	Brinton, H. C.	HQ-EL	Atreya, S. K.	NAGW 1442	4038
11	UNIV MICH-ANN ARBOR	Bergstralh, J. T.	HQ-EL	Clarke, J. T.	NAGW 1766	4046
11	UNIV MICH-ANN ARBOR	Bergstralh, J. T.	HQ-EL	Atreya, S.	NAGW 1771	4047
11	U MINN-MNPLS-ST PAUL	West, D.	GSFC	Gehr, R. D.	NAG 5-1185	4109
11	U MINN-MNPLS-ST PAUL	West, D.	GSFC	Skillman, E. D.	NAG 5-1281	4110
11	U MINN-MNPLS-ST PAUL	Havrisik, D.	MSFC	Waddington, C. J.	NAG 8-500	4112
11	U MINN-MNPLS-ST PAUL	Evans, L. G.	HQ-EL	Mauersberger, K.	NAGW 505	4115
11	U MINN-MNPLS-ST PAUL	Mellott, M. M.	HQ-ES	Waddington, C. J.	NGR 24-005-050	4129
11	UNIV MO-ST LOUIS	Kondo, Y.	GSFC	Wilking, B. A.	NAG 5-1157	4184
11	UNIV NEBRASKA-LINCLN	Kondo, Y.	GSFC	Leung, K. C.	NAG 5-825	4239
11	UNIV NEBRASKA-LINCLN	Kondo, Y.	GSFC	Schmidt, E. G.	NAG 5-839	4240
11	UNIV NEBRASKA-LINCLN	Bergstralh, J. T.	HQ-EL	Samson, J. A.	NAGW 1751	4249
11	UNIV NEVADA-L VEGAS	Bergstralh, J. T.	HQ-EL	Farley, J. W.	NAGW 1585	4253
11	UNIV NEW HAMP-DURHAM	Lasher, L. E.	ARC	Vestrand, W. T.	NAG 2-521	4282
11	UNIV NEW HAMP-DURHAM	McDonald, F. B.	GSFC	Webber, W. R.	NAG 5-515	4283
11	UNIV NEW HAMP-DURHAM	Cooley, J.	GSFC	Lockwood, J. A.	NAS 5-26645	4300
11	UNIV NEW HAMP-DURHAM	Mellott, M. M.	HQ-ES	Webber, W. R.	NGR 30-002-052	4307
11	UNIV NEW HAMP-DURHAM	Kaluzienski, L. J.	HQ-EZ	Chupp, E. L.	NGL 30-002-021	4306
11	UNIV NEW HAMP-DURHAM	Kaluzienski, L. J.	HQ-EZ	Lockwood, J. A.	NSG 7481	4311
11	UNIV OF NEW MEXICO	West, D.	GSFC	Duric, N.	NAG 5-1239	4416
11	UNIV OF NEW MEXICO	Harper, B. A.	MSFC	Halpern, J.	NAG 8-668	4417
11	UNIV OF NEW MEXICO	Havrisik, D.	MSFC	Burns, J. O.	NAG 8-747	4418
11	UNIV N CAR-CHPL HILL	Bergstralh, J. T.	HQ-EL	Miller, R. E.	NAGW 1576	4829
11	UNIV OF PENNSYLVANIA	Winget, C. M.	ARC	Heathcote, D. G.	NAG 2-556	5379
11	UNIV OF PENNSYLVANIA	Kondo, Y.	GSFC	Koch, R. H.	NAG 5-1015	5380
11	UNIV OF PENNSYLVANIA	West, D. K.	GSFC	Koch, R. H.	NAG 5-1168	5382
11	UNIV OF PENNSYLVANIA	Carter, D. C.	MSFC	Voet, D. H.	NAG 8-611	5383
11	UNIV OF PENNSYLVANIA	Bergstralh, J. T.	HQ-EL	Soberman, R. K.	NAGW 1782	5387
11	UNIV OF PITTSBURGH	Scargle, J.	ARC	Gatewood, G. D.	NAG 2-53	5396
11	UNIV OF PITTSBURGH	Rahe, J. H.	HQ-EL	Wefel, J. P.	NAGW 1270	5404
11	UNIV OF PITTSBURGH	Bergstralh, J. T.	HQ-EL	Johnsen, R.	NAGW 1764	5406
11	UNIV OF PITTSBURGH	Underwood, J. R.	HQ-EL	Hapke, B.	NSG 7147	5409
11	UNIV OF ROCHESTER	Goebel, J. H.	ARC	Forrest, W. J.	NAG 2-117	4744
11	UNIV OF ROCHESTER	Haughney, L. C.	ARC	Wengler, M. J.	NAG 2-539	4745
11	UNIV OF SOUTHERN CAL	Hollenbach, D. J.	ARC	Prasad, S. S.	NCA 2-254	2366

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11	UNIV OF SOUTHERN CAL	West, D.	GSFC	Peters, G. J.	NSG 5422	2376
11	UNIV OF SOUTHERN CAL	Gillett, F. C.	HQ-EZ	Prasad, S. S.	NAGW 1797	2363
11	UNIV SOUTHWESTERN LA	Reynolds, R. T.	ARC	Whitmire, D. P.	NCA 2-273	3430
11	UNIV TEXAS-AUSTIN	Haughney, L. C.	ARC	Harvey, P. M.	NAG 2-67	5766
11	UNIV TEXAS-AUSTIN	Haughney, L. C.	ARC	Dinerstein, H. L.	NAG 2-372	5767
11	UNIV TEXAS-AUSTIN	Haughney, L. C.	ARC	Jaffee, D. T.	NAG 2-419	5770
11	UNIV TEXAS-AUSTIN	Haughney, L. C.	ARC	Evans, N. J.	NAG 2-420	5771
11	UNIV TEXAS-AUSTIN	Nishioka, K.	ARC	Jefferys, W. H.	NAG 2-545	5773
11	UNIV TEXAS-AUSTIN	Kondo, Y.	GSFC	Danly, L.	NAG 5-978	5785
11	UNIV TEXAS-AUSTIN	Kondo, Y.	GSFC	Lambert, D. L.	NAG 5-987	5786
11	UNIV TEXAS-AUSTIN	Kondo, Y.	GSFC	Winget, D. E.	NAG 5-994	5787
11	UNIV TEXAS-AUSTIN	West, D.	GSFC	Wills, B.	NAG 5-1108	5791
11	UNIV TEXAS-AUSTIN	West, D.	GSFC	Scalo, J.	NAG 5-1263	5793
11	UNIV TEXAS-AUSTIN	Vitagliano, H. D.	GSFC	Trafton, L.	NAS 5-29395	5821
11	UNIV TEXAS-AUSTIN	Taylor, W. E.	MSFC	Lambert, D. L.	NAS 8-32905	5824
11	UNIV TEXAS-AUSTIN	Harrington, M. M.	MSFC	Jefferys, W. H.	NAS 8-32906	5825
11	UNIV TEXAS-AUSTIN	Rahe, J. H.	HQ-EL	Smith, H. J.	NAGW 1477	5816
11	UNIV TEXAS-AUSTIN	Brinton, H. C.	HQ-EL	Smith, H. J.	NGR 44-012-152	5833
11	UNIV TEXAS-AUSTIN	Stachnik, R. V.	HQ-EZ	Tapley, B. D.	NAGW 1330	5815
11	UNIV TEXAS-AUSTIN	Clayton, G. C.	HQ-EZ	Hemenway, P. D.	NAGW 1537	5818
11	UNIV TEXAS-AUSTIN	Owens, F. C.	HQ-XE	Smoluchowski, R.	NGT 00-050-180	5837
11	UNIV TEXAS-AUSTIN	Owens, F. C.	HQ-XE	Lambert, D. L.	NGT 00-050-249	5841
11	UNIV TEXAS-AUSTIN	Owens, F. C.	HQ-XE	Cochran, W. D.	NGT 00-050-311	5842
11	UNIV TEXAS-AUSTIN	Owens, F. C.	HQ-XE	Shapiro, P. R.	NGT 00-050-316	5843
11	UNIV TEXAS-AUSTIN	Owens, F. C.	HQ-XE	Winget, D. E.	NGT 00-050-468	5846
11	UNIV TEXAS-AUSTIN	Owens, F. C.	HQ-XE	Jaffe, D.	NGT 00-050-476	5848
11	UNIV TEXAS-DALLAS	Moore, T. E.	MSFC	Heelis, R. A.	NAS 8-36954	5876
11	UNIV TEXAS-DALLAS	Bergstralh, J. T.	HQ-EL	Hoffman, J. T.	NAGW 1267	5868
11	UNIV OF TOLEDO	Kondo, Y.	GSFC	Morrison, N. D.	NAG 5-253	5159
11	UNIV OF TOLEDO	West, D.	GSFC	Bopp, B. W.	NAG 5-954	5161
11	UNIV OF TOLEDO	West, D.	GSFC	Anderson, L. S.	NAG 5-970	5162
11	UNIV OF TOLEDO	Kondo, Y.	GSFC	Morrison, N. D.	NAG 5-979	5163
11	UNIV OF TOLEDO	West, D.	GSFC	Witt, A.	NAG 5-1065	5164
11	UNIV OF VIRGINIA	Kondo, Y.	GSFC	Thuan, T. X.	NAG 5-257	6112
11	UNIV OF VIRGINIA	Stecher, T. P.	GSFC	O'Connell, R. W.	NAG 5-700	6113
11	UNIV OF VIRGINIA	Kondo, Y.	GSFC	O'connell, R. W.	NAG 5-981	6117
11	UNIV OF VIRGINIA	Kondo, Y.	GSFC	O'connell, R. W.	NAG 5-1035	6119
11	UNIV OF VIRGINIA	Kondo, Y.	GSFC	Balbus, S.	NAG 5-1059	6120
11	UNIV OF VIRGINIA	West, D.	GSFC	Whittle, D. M.	NAG 5-1264	6121
11	UNIV OF VIRGINIA	West, D.	GSFC	O'connell, R. W.	NAG 5-1265	6122
11	UNIV OF VIRGINIA	Kaluzienski, L. J.	HQ-EZ	Hawley, J. F.	NAGW 1510	6130
11	UNIV OF WASHINGTON	West, D.	GSFC	Bohm, K. H.	NAG 5-45	6261
11	UNIV OF WASHINGTON	West, D.	GSFC	Brown, D.	NAG 5-357	6262
11	UNIV OF WASHINGTON	Kondo, Y.	GSFC	Hodge, P. W.	NAG 5-1020	6270
11	UNIV OF WASHINGTON	West, D. K.	GSFC	Wallerstein, G.	NAG 5-1150	6272
11	UNIV OF WASHINGTON	West, D.	GSFC	Margon, B.	NAG 5-1253	6273
11	UNIV OF WASHINGTON	West, D.	GSFC	Anderson, S. F.	NAG 5-1254	6274
11	UNIV OF WASHINGTON	West, D.	GSFC	Vitense, E. B.	NAG 5-1255	6275
11	UNIV OF WASHINGTON	Kondo, Y.	GSFC	Szkody, P.	NSG 5395	6337
11	UNIV OF WASHINGTON	West, D.	GSFC	Bohm-vitense, E.	NSG 5398	6338
11	UNIV OF WASHINGTON	Harper, B. A.	MSFC	Margon, B.	NAG 8-590	6277
11	UNIV OF WASHINGTON	Potter, P. Y.	MSFC	Deeter, J. E.	NAG 8-608	6278
11	UNIV OF WASHINGTON	Harper, B.	MSFC	Deeter, J. E.	NAG 8-695	6279
11	UNIV OF WASHINGTON	Harper, B. A.	MSFC	Szkody, P.	NAG 8-696	6280
11	UNIV OF WASHINGTON	Kaluzienski, L. J.	HQ-EZ	Deeter, J. E.	NAGW 1133	6298
11	UNIV OF WASHINGTON	Clayton, G.	HQ-EZ	Margon, B.	NAGW 1163	6301
11	UNIV OF WASHINGTON	Owens, F. C.	HQ-XE	Margon, B.	NGT 00-070-050	6336
11	UNIV OF WASHINGTON	Owens, F. C.	HQ-LE	Vitense, E. B.	NGT 00-070-006	6335
11	UNIV WISC-MADISON	Craig, R. A.	ARC	Limaye, S.	NAG 2-265	6373
11	UNIV WISC-MADISON	Craig, R. A.	ARC	Revercomb, H.	NAG 2-266	6374

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11	UNIV WISC-MADISON	West, D.	GSFC	Savage, B. D.	NAG 5-186	6385
11	UNIV WISC-MADISON	Kondo, Y.	GSFC	Cardelli, J. A.	NAG 5-832	6393
11	UNIV WISC-MADISON	Kondo, Y.	GSFC	Clayton, G.	NAG 5-1078	6398
11	UNIV WISC-MADISON	Barr, A.	GSFC	Bliss, R.	NAS 5-24487	6431
11	UNIV WISC-MADISON	Ladaudio, J.	GSFC	Kraushaer, W. L.	NAS 5-26078	6432
11	UNIV WISC-MADISON	Vitagliano, H. D.	GSFC	Savage, B. D.	NAS 5-29368	6434
11	UNIV WISC-MADISON	Vitagliano, H. D.	GSFC	Roesler, F.	NAS 5-30131	6436
11	UNIV WISC-MADISON	Johnson, W. G.	MSFC	Cassinelli, J. P.	NAG 8-534	6402
11	UNIV WISC-MADISON	Potter, P. Y.	MSFC	Cassinelli, J. P.	NAG 8-602	6403
11	UNIV WISC-MADISON	Harper, B.	MSFC	Hoessel, J. G.	NAG 8-725	6405
11	UNIV WISC-MADISON	Owens, J.	MSFC	Code, A. D.	NAS 5-26777	6433
11	UNIV WISC-MADISON	Brinton, H. C.	HQ-EL	Scherb, F.	NAGW 695	6411
11	UNIV WISC-MADISON	Clayton, G. C.	HQ-EZ	Cassinella, V.	NAGW 422	6410
11	UNIV WISC-MADISON	Clayton, G. C.	HQ-EZ	Mathis, J. S.	NAGW 1768	6424
11	UNIV WISC-MADISON	Owens, F. C.	HQ-XE	Savage, B. D.	NGT 00-070-024	6452
11	UNIV OF WYOMING	Haughney, L. C.	ARC	Thronson, H. A., Jr.	NAG 2-134	6463
11	UNIV OF WYOMING	West, D.	GSFC	Canterna, R. W.	NAG 5-1245	6466
11	UNIV OF WYOMING	West, D.	GSFC	Bontekoe, T. R.	NAG 5-1246	6467
11	UNIV OF WYOMING	Brinton, H. C.	HQ-EL	Howell, R. R.	NAGW 1276	6468
11	VALPARISO UNIV	Kondo, Y.	GSFC	Hrivnak, B. J.	NAG 5-964	3259
11	VANDERBILT UNIVERSITY	West, D. K.	GSFC	Fekel Jr., F. C.	NAG 5-397	5532
11	VILLANOVA UNIVERSITY	West, D.	GSFC	Sion, E. M.	NAG 5-343	5410
11	VILLANOVA UNIVERSITY	West, D.	GSFC	Guinan, E. F.	NAG 5-382	5411
11	VILLANOVA UNIVERSITY	West, D.	GSFC	Ambruster, C.	NAG 5-980	5412
11	VILLANOVA UNIVERSITY	Kondo, Y.	GSFC	Guinan, E. F.	NAG 5-982	5413
11	VILLANOVA UNIVERSITY	West, D.	GSFC	Sion, E. M.	NAG 5-1284	5414
11	VIRGINIA POLY INST	West, D.	GSFC	Broderick, J. J.	NAG 5-1274	6215
11	VIRGINIA POLY INST	West, D.	GSFC	Simonetti, J. H.	NAG 5-1275	6216
11	VIRGINIA POLY INST	Owens, F. C.	HQ-LE	Dugger, W. E.	NGT 47-004-810	6243
11	WASHINGTON ST UNIV	Kondo, Y.	GSFC	Lutz, J.	NAG 5-1075	6343
11	WASHINGTON UNIVERSITY	Ormes, J. F.	GSFC	Binns, W. R.	NAG 5-846	4190
11	WASHINGTON UNIVERSITY	Havrisik, D. M.	MSFC	Israel, M. H.	NAG 8-498	4191
11	WASHINGTON UNIVERSITY	Brinton, H. C.	HQ-EL	Smith, W. H.	NAGW 883	4201
11	WASHINGTON UNIVERSITY	Mahaffy, P. R.	HQ-EL	Smith, W. H.	NAGW 1801	4206
11	WASHINGTON UNIVERSITY	Brinton, H. C.	HQ-EL	Smith, W. H.	NSG 7334	4226
11	WASHINGTON UNIVERSITY	Mellott, M. M.	HQ-ES	Israel, M. H.	NGR 26-008-001	4213
11	WELLESLEY COLLEGE	Kondo, Y.	GSFC	Marenin, I. L.	NAG 5-438	3930
11	WELLESLEY COLLEGE	West, D.	GSFC	Bauer, W. H.	NAG 5-1213	3931
11	WHEATON COLLEGE	Kondo, Y.	GSFC	Barker, T.	NSG 5376	3936
11	WILLIAMS COLLEGE	Kondo, Y.	GSFC	Friend, D. B.	NAG 5-1029	3937
11	YALE UNIVERSITY	Nishioka, K.	ARC	Sofia, S.	NAG 2-535	2594
11	YALE UNIVERSITY	Mellott, M. M.	HQ-ES	Demarque, P.	NAGW 777	2604
11	YALE UNIVERSITY	Owens, F. C.	HQ-LE	Demarque, P.	NGT 07-001-800	2612
12	ALABAMA A&M UNIV	Austin, J. G., Jr.	MSFC	Thompson, J. H.	NAS 8-36299	1019
12	ARIZONA STATE UNIV	Owens, F. C.	HQ-XE	Cronin, J.	NGT 00-070-100	1275
12	ARIZONA STATE UNIV	Owens, F. C.	HQ-LE	Greeley, R.	NGT 03-001-803	1277
12	ARKANSAS COL	Gibson, E. K.	JSC	Bustin, R.	NAG 9-222	1481
12	ARKANSAS COL	Gibson, E.	JSC	Bustin, R.	NAG 9-373	1483
12	AUBURN UNIV-AUBURN	Browne, I. D.	JSC	Salpas, P. A.	NAG 9-330	1032
12	BAYLOR UNIVERSITY	Hines, J. W.	ARC	Scouten, W. H.	NCA 2-409	5551
12	BOWLING GRN STATE U	Owens, F. C.	HQ-LE	Srinivasan, V.	NGT 36-002-800	4843
12	CALIF INST OF TECH	Browne, I. D.	JSC	Epstein, S.	NAG 9-46	1524
12	CALIF INST OF TECH	Rummel, J. D.	HQ-EB	Epstein, S.	NAGW 1435	1545
12	CALIF INST OF TECH	Owens, F. C.	HQ-XE	McKoy, V.	NGT 00-050-170	1574
12	CALIF INST OF TECH	Owens, F. C.	HQ-XE	Stolper, E. M.	NGT 00-050-501	1580
12	CASE WESTERN RESERVE	Rabinowitz, M. J.	LARC	Prahl, J. M.	NCC 3-85	4909
12	CASE WESTERN RESERVE	Smialek, J. L.	LERC	Anderson, A. B.	NAG 3-688	4859
12	CASE WESTERN RESERVE	Ferguson, D. C.	LERC	Ech, T. G.	NAG 3-696	4861
12	CASE WESTERN RESERVE	Fielder, W. L.	LERC	Yeager, E. B.	NAG 3-1077	4893
12	CASE WESTERN RESERVE	Philipp, W. H.	LERC	Adler, R. J.	NCC 3-80	4907

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12	CASE WESTERN RESERVE	Meador, M. A.	LERC	Jukenik, C. N.	NCC 3-112	4916
12	CASE WESTERN RESERVE	Owens, F. C.	HQ-XE	Sukenik, C. N.	NGT 00-050-136	4933
12	CASE WESTERN RESERVE	Owens, F. C.	HQ-XE	Youngs, W.	NGT 00-050-375	4936
12	CASE WESTERN RESERVE	Owens, F. C.	HQ-XE	Klopman, G.	NGT 00-050-440	4937
12	CATHOLIC UNIVERSITY	Nava, D. F.	GSFC	Guiman, D.	NSG 5173	2653
12	CHRISTPHR NEWPT COL	Rhinehart, R. P.	LARC	Sacks, L. J.	NAG 1-268	5962
12	CHRISTPHR NEWPT COL	Conway, E. J.	LARC	Chang, C. K.	NAG 1-523	5964
12	CLEVELAND STATE UNIV	Crandall, K. S.	LERC	Megargle, R. G.	NCC 3-47	4967
12	CLEVELAND STATE UNIV	Davies, R. L.	LERC	Megargle, R. G.	NCC 3-122	4985
12	COLUMBIA UNIVERSITY	Owens, F. C.	HQ-XE	Wolgemuth, D. J.	NGT 00-050-315	4506
12	CORNELL UNIVERSITY	Rummel, J.	HQ-EB	Usher, D. A.	NAGW 493	4536
12	CORNELL UNIVERSITY	Rummel, J. D.	HQ-EB	Sagan, C. E.	NGR 33-010-101	4573
12	DUKE UNIVERSITY	Owens, F. C.	HQ-XE	Richardson, D.	NGT 00-050-366	4765
12	FLORIDA A&M UNIV	Huo, W. M.	ARC	Weatherford, C. A.	NCC 2-492	2716
12	FLORIDA INST OF TECH	Nicholson, L.	KSC	Thomas, J. J.	NAG10-60	2729
12	GEORGIA INST OF TECH	Baucom, R. M.	LARC	Muzzy, J. D.	NAG 1-864	2850
12	GEORGIA INST OF TECH	Snyder, R. S.	MSFC	Suddath, F. L.	NAG 8-713	2875
12	GEORGIA INST OF TECH	Owens, F. C.	HQ-XE	Suddath, F. L.	NGT 00-050-208	2896
12	GEORGIA SOUTHERN COL	Donn, B.	GSFC	Nelson, R. H.	NAG 5-496	2904
12	HAMPTON UNIVERSITY	Hergenrother, P. M.	LARC	Nwokogu, G.	NAG 1-905	6010
12	INDIANA U-BLOOMINGTN	Rummel, J.	HQ-EB	Hayes, J. M.	NGR 15-003-118	3184
12	INDIANA U-BLOOMINGTN	Owens, F. C.	HQ-XE	Hayes, J. M.	NGT 00-050-237	3185
12	LE TOURNEAU COLLEGE	Albyn, K. C.	JSC	Johnson, R. E.	NAG 9-356	5566
12	MARY WASHINGTON COL	Alston, W. B.	LERC	Gratz, R. F.	NAG 3-794	6022
12	MASS INST OF TECH	Ormes, J. A.	GSFC	Sullivan, J. D.	NAG 5-874	3765
12	MASS INST OF TECH	Rummel, J. D.	HQ-EB	Rich, A.	NGR 22-009-277	3859
12	MASS INST OF TECH	Bergstralh, J. T.	HQ-EL	Fegley, B.	NAGW 1816	3829
12	MICHIGAN STATE UNIV	Meador, M. A.	LERC	Hart, H.	NAG 3-670	3960
12	MICHIGAN TECH UNIV	Dreshfield, R. L.	LERC	Heckel, R. W.	NAG 3-216	3969
12	MONTANA STATE UNIV	Sauer, R. L.	JSC	McFeters, G. A.	NAG 9-241	4230
12	MT SAINT MARYS COL	Leonard, R. F.	LERC	Richman, R. M.	NAG 3-979	3500
12	NO CAR A&T STATE U	Mapp, M. W.	LERC	Williamson, A. N.	NAG 3-739	4778
12	NORTHROP UNIVERSITY	Van Tassel, K.	JSC	Maddox, A.	NAG 9-273	1625
12	NORTHWESTERN UNIV	Jones, W. R.	LERC	Stair, P. C.	NAG 3-896	2996
12	OLD DOMINION UNIV	Baucom, R. M.	LARC	Tiwari, S. N.	NAG 1-569	6033
12	PA ST U-HERSHEY MED	Owens, F. C.	HQ-XE	Severs, W. B.	NGT 00-070-035	5276
12	PENN STATE U-UNIV PK	Lezberg, E. A.	LERC	Frenklach, M.	NAG 3-668	5296
12	PENN STATE U-UNIV PK	Rabinowitz, M. J.	LERC	Frenklach, M. Y.	NAG 3-991	5302
12	PORTLAND STATE UNIV	Owens, F. C.	HQ-XE	O'Brien, R. J.	NGT 00-070-054	5217
12	PRINCETON UNIVERSITY	Huo, W. M.	ARC	Rabitz, H.	NCC 2-571	4355
12	PRINCETON UNIVERSITY	Owens, F. C.	HQ-XE	Sarmiento, J.	NGT 00-050-425	4362
12	PURDUE UNIVERSITY	Browne, I. D.	JSC	Lipschutz, M. E.	NAG 9-48	3220
12	PURDUE UNIVERSITY	Lezberg, E.	LERC	Laurendeau, N. M.	NAG 3-360	3200
12	PURDUE UNIVERSITY	Meador, M. A.	LERC	Kubiak, C. P.	NAG 3-977	3211
12	PURDUE UNIVERSITY	Owens, F. C.	HQ-XE	Grant, E. R.	NGT 00-070-139	3243
12	RENSSELAER POLY-NY	Connell, J. W.	LARC	Crivello, J. V.	NAG 1-980	4626
12	RENSSELAER POLY-NY	Rummel, J. D.	HQ-EB	Ferris, J. P.	NGR 33-018-148	4647
12	RUTGERS ST U-CAMDEN	Meador, M. A.	LERC	Burke, L. A.	NAG 3-956	4366
12	RUTGERS ST U-N BRNSK	Owens, F. C.	HQ-XE	Hewins, R.	NGT 00-050-219	4370
12	ST NORBERT COLLEGE	Delvigs, P.	LARC	Klopotek, D. L.	NAG 3-710	6369
12	SAN FRAN STATE UNIV	Pollack, J.	ARC	Orenberg, J.	NCA 2-444	1639
12	SAN JOSE STATE UNIV	Stoker, C.	ARC	Becker, J. F.	NCA 2-427	1659
12	SAN JOSE STATE UNIV	Chang, S.	ARC	Ling, A. C.	NCC 2-153	1662
12	SAN JOSE STATE UNIV	Owens, F. C.	HQ-XE	Yengoyan, L. S.	NGT 00-070-068	1681
12	SAN JOSE STATE UNIV	Owens, F. C.	HQ-XE	Englert, P.	NGT 00-070-131	1683
12	SAN JOSE STATE UNIV	Owens, F. C.	HQ-XE	Yengoyan, L. S.	NGT 00-070-136	1684
12	SONOMA STATE UNIV	West, D.	GSFC	Cominsky, L. R.	NAG 5-1260	1686
12	SO ILL UNIV-CARBOND	Valentin, J. R.	ARC	Phillips, J. B.	NCA 2-392	3018
12	SW TEXAS STATE UNIV	St Clair, A. K.	LARC	Cassidy, P. E.	NAG 1-631	5614
12	STANFORD UNIVERSITY	Jaffe, R. L.	ARC	Zare, R. N.	NAG 2-472	1701

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12	STANFORD UNIVERSITY	Cooper, D. M.	ARC	Madix, R. J.	NCC 2-394	1813
12	STATE UNIV NY-ALBANY	Chang, S.	ARC	Scattergood, T. W.	NCC 2-311	4671
12	STATE U NY-BINGHAMTN	Owens, F. C.	HQ-XE	Janauer, G. E.	NGT 00-050-226	4680
12	STATE U NY-STONY BRK	Sutter, J. K.	LERC	Gelernter, H. L.	NAG 3-651	4704
12	STATE U NY-STONY BRK	Rummel, J. D.	HQ-EB	Owens, T.	NAGW 725	4714
12	TEXAS A&M UNIVERSITY	Price, D. F.	JSC	Bockris, J. O.	NAG 9-283	5661
12	TEXAS A&M UNIVERSITY	Thompson, D. R.	JSC	Bockris, J. O.	NAG 9-289	5662
12	TEXAS A&M UNIVERSITY	Owens, F. C.	HQ-XE	Hossner, L.	NGT 00-050-215	5685
12	TEXAS SOUTHERN UNIV	McKay, D. S.	JSC	Wilson, B. L.	NAG 9-299	5704
12	TUSKEGEE UNIVERSITY	Bryan, C. J.	KSC	Vahdat, N.	NAG10-31	1069
12	TUSKEGEE UNIVERSITY	Bryan, C. J.	KSC	Vandat, N.	NAG10-62	1070
12	UTICA COLLEGE	Sutter, J. K.	LERC	Cerny, L. C.	NAG 3-842	4750
12	UNIV OF AKRON	Hergenrother, P. M.	LARC	Harris, F. W.	NAG 1-448	5078
12	UNIV ALA-BIRMINGHAM	Snyder, R. S.	MSFC	Delucas, L. J.	NAG 8-763	1077
12	UNIV ALA-BIRMINGHAM	Rummel, J. D.	HQ-EB	Lacey, J. C.	NAGW 1512	1081
12	UNIV ALA-BIRMINGHAM	Rummel, J. D.	HQ-EB	Lacey, J. C., Jr.	NGR 01-010-001	1084
12	UNIV ALA-HUNTSVILLE	Fields, S. A.	MSFC	Lundquist, C. A.	NAG 8-60	1097
12	UNIV ALA-HUNTSVILLE	Decher, R.	MSFC	Torr, D. G.	NAG 8-67	1100
12	UNIV ALA-HUNTSVILLE	Peters, P. N.	MSFC	Gregory, J. C.	NAS 8-36645	1163
12	UNIV ALA-HUNTSVILLE	Higgins, D.	MSFC	Baird, J. K.	NAS 8-37195	1169
12	UNIV OF ARIZONA	Browne, I. D.	JSC	Boynton, W. V.	NAG 9-37	1339
12	UNIV OF ARIZONA	Browne, I. D.	JSC	Drake, M. J.	NAG 9-39	1340
12	UNIV OF ARIZONA	Bergstralh, J. T.	HQ-EL	Shemansky, D. E.	NAGW 649	1355
12	UNIV OF ARIZONA	Owens, F. C.	HQ-XE	Weinberg, M. C.	NGT 00-050-287	1456
12	UNIV OF ARIZONA	Owens, F. C.	HQ-LE	Drake, M. J.	NGT 00-050-051	1447
12	UNIV ARKANSAS-FAYETV	Owens, F. C.	HQ-LE	Sears, D. W.	NGT 00-050-064	1490
12	UNIV CALIF-BERKELEY	Rummel, J. D.	HQ-EB	Jukes, J. H.	NGR 05-003-460	1972
12	UNIV CALIF-BERKELEY	Owens, F. C.	HQ-XE	Sadoulet, B.	NGT 00-050-462	1994
12	UNIV CALIF-DAVIS	Rummel, J. D.	HQ-EB	Deamer, D. W.	NAGW 1119	2014
12	UNIV CALIF-L ANGELES	Toon, O. B.	ARC	Turco, R.	NCA 2-305	2136
12	UNIV CALIF-L ANGELES	Browne, I. D.	JSC	Kerridge, J. F.	NAG 9-27	2090
12	UNIV CALIF-L ANGELES	Rummel, J. D.	HQ-EB	Kerridge, J. F.	NAGW 347	2100
12	UNIV CALIF-L ANGELES	Owens, F. C.	HQ-LE	Nicol, M. F.	NGT 05-006-801	2157
12	UNIV CALIF-RIVERSIDE	Owens, F. C.	HQ-XE	Scott, G. W.	NGT 00-050-156	2166
12	UNIV CALIF-SAN DIEGO	Browne, I. D.	JSC	Arnold, J. R.	NAG 9-33	2197
12	UNIV CALIF-SAN DIEGO	Browne, I. D.	JSC	Marti, K.	NAG 9-41	2198
12	UNIV CALIF-SAN DIEGO	Harper, B.	MSFC	Gruber, D. E.	NAG 8-645	2192
12	UNIV CALIF-SAN DIEGO	Owens, F. C.	HQ-XE	Thiemens, M. H.	NGT 00-050-174	2258
12	UNIV CALIF-SAN DIEGO	Owens, F. C.	HQ-XE	Miller, S. L.	NGT 00-050-296	2261
12	UNIV CALIF-S CRUZ	Chang, S.	ARC	Kanavarioti, A.	NCA 2-289	2318
12	UNIV CALIF-S CRUZ	Chang, S.	ARC	Kanavarioti, A.	NCC 2-534	2327
12	UNIV OF CHICAGO	West, D. K.	GSFC	York, D. G.	NAG 5-286	3023
12	UNIV OF CHICAGO	Owens, F. C.	HQ-LE	Anders, E.	NGT 00-050-015	3074
12	UNIV OF CHICAGO	Owens, F. C.	HQ-LE	Clayton, R. N.	NGT 00-050-041	3075
12	UNIV OF CHICAGO	Owens, F. C.	HQ-LE	Clayton, R. N.	NGT 14-020-806	3091
12	UNIV OF CINCINNATI	Meador, M. A.	LERC	Zimmer, H.	NAG 3-995	5122
12	UNIV COLORADO-DENVER	Owens, F. C.	HQ-XE	Stedman, D. H.	NGT 00-050-318	2571
12	UNIV OF CONNECTICUT	Young, P. R.	LARC	Sung, C. S.	NAG 1-931	2586
12	UNIV OF DENVER	Owens, F. C.	HQ-LE	Stedman, D. H.	NGT 00-050-013	2580
12	UNIV HOUSTON-HOUSTON	Jaffe, R. L.	ARC	Kouri, D. J.	NAG 2-503	5709
12	UNIV HOUSTON-HOUSTON	Schneider, H. J.	JSC	Middleditch, B. S.	NAG 9-218	5722
12	UNIV HOUSTON-HOUSTON	Owens, F. C.	HQ-XE	Fox, G.	NGT 00-050-173	5747
12	UNIV ILLINOIS-URBANA	Fogleman, S. W.	HQ-EB	Woese, C. R.	NSG 7044	3166
12	UNIV OF IOWA	Williamson, G. S.	LERC	Eyman, D. P.	NAG 3-893	3294
12	UNIV OF IOWA	Williamson, G. S.	LERC	Coffman, R. E.	NAG 3-1056	3295
12	UNIV OF KANSAS	Owens, F. C.	HQ-XE	Cravens, T. E.	NGT 00-050-472	3380
12	UNIV OF KENTUCKY	Jaffe, R. L.	ARC	Pattengill, M. D.	NCC 2-483	3390
12	UNIV MARYLAND-COL PK	Donn, B. D.	GSFC	Khanna, R. K.	NSG 5172	3636
12	UNIV MARYLAND-COL PK	Fogleman, S. W.	HQ-EB	Ponnamperuma, C. A.	NGR 21-002-317	3619
12	UNIV MARYLAND-COL PK	Owens, F. C.	HQ-XE	Khanna, R. K.	NGT 00-050-148	3622

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12	UNIV OF MIAMI	Rummel, J. D.	HQ-EB	Fox, S. W.	NGR 10-007-008	2820
12	UNIV MICH-ANN ARBOR	Rummel, J. D.	HQ-EB	Walker, J. C.	NAGW 176	4022
12	U MINN-MNPLS-ST PAUL	Cooper, D. M.	ARC	Truhlar, D. G.	NCC 2-526	4128
12	U MINN-MNPLS-ST PAUL	Mahaffy, P.	HQ-EL	Nier, A. O.	NASW 4215	4125
12	UNIV MO-ROLLA	Sutton, K.	LARC	Biolsi Jr., L.	NAG 1-380	4177
12	UNIV MO-ROLLA	Ethridge, E. C.	MSFC	Ray, C. S.	NAG 8-779	4182
12	UNIV OF PENNSYLVANIA	Snyder, R. S.	MSFC	Voet, D.	NAG 8-770	5384
12	UNIV OF VIRGINIA	Owens, F. C.	HQ-XE	McVey, E.	NGT 00-050-345	6148
12	UNIV OF WASHINGTON	McLachlan, B. G.	ARC	Gouterman, M.	NCA 2-296	6325
12	COLLEGE OF WM & MARY	Long, E. R.	LARC	Kranbuehl, D. E.	NAG 1-237	5970
12	COLLEGE OF WM & MARY	Freeman, W. T.	LARC	Kranbuehl, D. E.	NAG 1-896	5975
12	COLLEGE OF WM & MARY	Long, E. R.	LARC	Kranbuehl, D. E.	NAG 1-1019	5979
12	COLLEGE OF WM & MARY	Long, S. T.	LARC	Kiefer, R. L.	NCC 1-126	5988
12	COLLEGE OF WM & MARY	Owens, F. C.	HQ-XE	Kiefer, R.	NGT 00-070-091	5992
12	VIRGINIA COMNWLT U	Hergenrother, P. M.	LARC	Bass, R. G.	NAG 1-239	6155
12	VIRGINIA COMNWLT U	Johnston, N. J.	LARC	Ottenbrite, R. M.	NAG 1-672	6157
12	VIRGINIA COMNWLT U	Williams, M. D.	HQ-	Vallarino, L. M.	NAG 1-594	6156
12	WAKE FOREST UNIV	Phillips, D. H.	LARC	Jackels, C. F.	NCC 1-55	4839
12	WASHINGTON UNIVERSTY	Pollack, J. B.	ARC	Smith, W. H.	NCA 2-151	4210
12	WASHINGTON UNIVERSTY	Owens, F. C.	HQ-XE	Crozaz, G.	NGT 00-050-295	4222
12	WORCESTER POLY INST	Roberts, B.	JSC	Sacco, A.	NAG 9-221	3955
13	ALABAMA A&M UNIV	Randall, J. L.	MSFC	McGuire, S. C.	NAG 8-27	1002
13	ALABAMA A&M UNIV	Randall, J. L.	MSFC	Chong, K.	NAG 8-45	1006
13	ALABAMA A&M UNIV	Randall, J. L.	MSFC	Liaw, G.	NAG 8-64	1007
13	ALABAMA A&M UNIV	Randall, J. L.	MSFC	Lal, R. B.	NAG 8-76	1008
13	ALABAMA A&M UNIV	Randall, J. L.	MSFC	George, M. C.	NAG 8-107	1011
13	ALABAMA A&M UNIV	Randall, J. L.	MSFC	Aggarwal, M. D.	NAG 8-125	1013
13	ALABAMA A&M UNIV	Owens, F. C.	HQ-XE	Lal, R. B.	NGT 00-050-358	1023
13	AMERICAN UNIVERSITY	Owens, F. C.	HQ-XE	Kay, R. B.	NGT 00-050-333	2633
13	ATLANTA UNIVERSITY	Flood, D. J.	LERC	Neal, H. L.	NAG 3-777	2834
13	AUBURN UNIV-AUBURN	Carruth, M. R.	MSFC	Fromhold, A. T.	NAS 8-36471	1040
13	AUBURN UNIV-AUBURN	Owens, F. C.	HQ-XE	Barnes, P. A.	NGT 00-050-133	1048
13	AUGSBURG COLLEGE	Mellott, M. M.	HQ-ES	Engelbreton, M. J.	NAGW 1567	4098
13	BAYLOR UNIVERSITY	Horz, F.	JSC	Alexander, W. M.	NAG 9-321	5545
13	BOSTON COLLEGE	Brockman, P.	LARC	Dibartolo, B.	NAG 1-955	3640
13	BOSTON UNIVERSITY	Curtis, S. A.	GSFC	Mendillo, M.	NAG 5-490	3643
13	BOSTON UNIVERSITY	Early, L. J.	GSFC	Mendillo, M.	NAG 5-640	3644
13	BOSTON UNIVERSITY	Ormes, J. F.	GSFC	Beatty, J. J.	NAG 5-1013	3645
13	BOSTON UNIVERSITY	Coltrin, R. E.	LERC	Silverman, S. M.	NAGW 1518	3651
13	BOSTON UNIVERSITY	Mellott, M. M.	HQ-ES	Beatty, J. J.	NAGW 1032	3649
13	BOSTON UNIVERSITY	Mellott, M. M.	HQ-ES	Hughes, W. J.	NAGW 1627	3653
13	BOSTON UNIVERSITY	Mellott, M. M.	HQ-ES	Mendillo, M.	NAGW 1629	3654
13	BRANDEIS UNIVERSITY	Owens, F. C.	HQ-XE	Wardle, J. F.	NGT 00-050-308	3665
13	BROWN UNIVERSITY	Degnan, J. J.	GSFC	Lawandy, N. M.	NAG 5-526	5420
13	BROWN UNIVERSITY	Owens, F. C.	HQ-XE	Lawady, N.	NGT 00-050-146	5438
13	BROWN UNIVERSITY	Owens, F. C.	HQ-LE	Lawandy, N.	NGT 40-002-802	5444
13	CALIF INST OF TECH	Bullock, G. D.	GSFC	Zirin, H.	NAG 5-508	1500
13	CALIF INST OF TECH	Ormes, J. F.	GSFC	Mewaldt, R. A.	NAG 5-878	1505
13	CALIF INST OF TECH	Bohlin, J. D.	HQ-ES	Zirin, H.	NGL 05-002-034	1566
13	CALIF INST OF TECH	Gergely, T. E.	HQ-EZ	Zirin, H.	NAGW 832	1534
13	CALIF INST OF TECH	Clay, G. S.	HQ-EZ	Blandford, R. D.	NAGW 1301	1539
13	CALIF INST OF TECH	Owens, F. C.	HQ-XE	Libbrecht, K. G.	NGT 00-050-187	1575
13	CALIF INST OF TECH	Owens, F. C.	HQ-XE	Phillips, T. G.	NGT 00-050-429	1578
13	CALIF INST OF TECH	Owens, F. C.	HQ-LE	Prince, T. A.	NGT 00-050-092	1571
13	CALIF INST OF TECH	Owens, F. C.	HQ-LE	Lewis, J. S.	NGT 05-002-802	1581
13	CAL STATE U-FULLERTN	Browne, I. D.	JSC	Woolum, D. S.	NAG 9-57	1603
13	CAL STATE U-NRTHRDGE	Ahluwalia, H. S.	HQ-EZ	Chapman, G. A.	NAGW 688	1613
13	CAL STATE U-NRTHRDGE	Owens, F. C.	HQ-XE	Seki, R.	NGT 00-070-075	1615
13	CAL STATE U-NRTHRDGE	Owens, F. C.	HQ-XE	Seki, R.	NGT 00-070-152	1617
13	CASE WESTERN RESERVE	Good, B. S.	LERC	Segall, B.	NAG 3-698	4862

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13	CASE WESTERN RESERVE	Ferguson, D. C.	LERC	Greber, I.	NAG 3-795	4872
13	CASE WESTERN RESERVE	Aron, P. R.	LERC	Farrell, D. E.	NAG 3-814	4875
13	CASE WESTERN RESERVE	Gray, H. R.	LERC	Ostrach, S.	NAG 3-840	4879
13	CASE WESTERN RESERVE	Good, B. S.	LERC	Lambrecht, W. R.	NAG 3-954	4888
13	CASE WESTERN RESERVE	Haugland, E.	LERC	Segall, B.	NCC 3-25	4898
13	CASE WESTERN RESERVE	Ferrante, J.	LERC	Gordon, W. L.	NCC 3-71	4904
13	CASE WESTERN RESERVE	Weinberg, I.	LERC	Hoffman, R. W.	NCC 3-118	4918
13	CASE WESTERN RESERVE	Ferguson, D. C.	LERC	Eck, T. G.	NCC 3-141	4928
13	CATHOLIC UNIVERSITY	Danchenko, V.	GSFC	Litovchenko, V.	NAG 5-864	2641
13	CATHOLIC UNIVERSITY	Forrest, K.	GSFC	Meijer, P. H.	NAG 5-1036	2642
13	CATHOLIC UNIVERSITY	Fitzenreiter, R. J.	HQ-EE	Whang, Y. C.	NAGW 1057	2647
13	CATHOLIC UNIVERSITY	Mellott, M. M.	HQ-ES	Whang, Y. C.	NAGW 1595	2650
13	CATHOLIC UNIVERSITY	Ahluwalia, H. S.	HQ-EZ	Wernitz, C.	NAGW 1365	2649
13	CATHOLIC UNIVERSITY	Owens, F. C.	HQ-XE	Bruhweiler, F.	NGT 00-070-043	2651
13	CHRISTPHR NEWPRT COL	Madaras, E. I.	LARC	Smith, B. T.	NAG 1-431	5963
13	CHRISTPHR NEWPRT COL	Brockman, P.	LARC	Buoncristiani, A. M.	NAG 1-585	5965
13	CHRISTPHR NEWPRT COL	Brockman, P.	LARC	Buoncristiani, A. M.	NAG 1-796	5966
13	CITY COLLEGE OF N Y	Pollack, J. B.	ARC	Lea, R. M.	NCA 2-89	4433
13	CITY COLLEGE OF N Y	Allario, F.	LARC	Alfano, R. R.	NAG 1-810	4432
13	CITY COLLEGE OF N Y	Owens, F. C.	HQ-XE	Johnson, J. A.	NGT 00-070-053	4437
13	CITY COLLEGE OF N Y	Owens, F. C.	HQ-XE	Pierson, W. J.	NGT 00-070-098	4439
13	CLARKSON UNIVERSITY	Szofran, F. R.	MSFC	Wilcox, W. R.	NAG 8-753	4444
13	CLARKSON UNIVERSITY	Fogle, V.	MSFC	Subramanian, R. S.	NAS 8-32944	4447
13	CLEMSON UNIV-CLEMSON	Early, L. J.	GSFC	Larsen, M. F.	NAG 5-632	5461
13	CLEMSON UNIV-CLEMSON	Stone, J. F.	MSFC	Duncan, L. M.	NAS 8-37851	5465
13	CLEMSON UNIV-CLEMSON	Owens, F. C.	HQ-LB	Isgell, J. T.	NGT 41-001-800	5476
13	CLEVELAND STATE UNIV	Weinberg, I.	LERC	Goradia, C.	NAG 3-138	4942
13	CLEVELAND STATE UNIV	Aron, P. R.	LERC	Hambourgen, P. D.	NAG 3-873	4950
13	CLEVELAND STATE UNIV	Ferrante, J.	LERC	Kaufman, M.	NAG 3-924	4953
13	COLORADO STATE UNIV	Pouch, J. J.	LERC	Lile, D. L.	NAG 3-633	2383
13	COLORADO STATE UNIV	Rutledge, S. K.	LERC	Wilbur, P. J.	NAG 3-791	2385
13	COLUMBIA UNIVERSITY	Early, L. J.	GSFC	Novick, R.	NAG 5-618	4460
13	COLUMBIA UNIVERSITY	Early, L. J.	GSFC	Martin, C.	NAG 5-642	4461
13	COLUMBIA UNIVERSITY	Curreri, P. A.	MSFC	Wu, M. K.	NCC 8-6	4503
13	COLUMBIA UNIVERSITY	Mellott, M. M.	HQ-ES	Raup, D. M.	NAGW 894	4485
13	COLUMBIA UNIVERSITY	Mellott, M. M.	HQ-ES	Bhattacharjee, A.	NAGW 1610	4491
13	COLUMBIA UNIVERSITY	Owens, F. C.	HQ-XE	Martin, C.	NGT 00-050-198	4504
13	CORNELL UNIVERSITY	Stoker, C.	ARC	Thompson, W. R.	NCA 2-439	4570
13	CORNELL UNIVERSITY	Early, L. J.	GSFC	Kintner, P. M.	NAG 5-601	4524
13	CORNELL UNIVERSITY	Mellott, M. M.	HQ-EE	Seyler, C. E.	NAGW 757	4539
13	CORNELL UNIVERSITY	Ahluwalia, H. S.	HQ-ES	Sudan, R. N.	NAGW 1006	4541
13	CORNELL UNIVERSITY	Mellott, M. M.	HQ-ES	Kelley, M. C.	NAGW 1091	4545
13	CORNELL UNIVERSITY	Mellott, M. M.	HQ-ES	Steinhardt, A.	NAGW 1533	4559
13	CORNELL UNIVERSITY	Mellott, M. M.	HQ-ES	Seyler, C. E.	NAGW 1574	4560
13	CORNELL UNIVERSITY	Mellott, M. M.	HQ-ES	Kelley, M. C.	NAGW 1581	4561
13	CORNELL UNIVERSITY	Owens, F. C.	HQ-XE	Burns, J. A.	NGT 00-050-188	4575
13	CORNELL UNIVERSITY	Owens, F. C.	HQ-XE	Sievers, A. J.	NGT 00-050-264	4579
13	DARTMOUTH COLLEGE	Curtis, S. A.	GSFC	Hudson, M. K.	NAG 5-1098	4265
13	DARTMOUTH COLLEGE	O'brien, J.	GSFC	Hudson, M. K.	NAS 5-29233	4274
13	DARTMOUTH COLLEGE	Mellott, M. M.	HQ-ES	Montgomery, D. C.	NAGW 710	4268
13	DARTMOUTH COLLEGE	Desch, M. D.	HQ-ES	Hudson, M. K.	NAGW 809	4269
13	DARTMOUTH COLLEGE	Mellott, M. M.	HQ-ES	Lotko, W.	NAGW 1169	4271
13	DARTMOUTH COLLEGE	Mellott, M. M.	HQ-ES	Hudson, M. K.	NAGW 1652	4272
13	DE PAUW UNIVERSITY	Denton, T. L.	MSFC	Brooks, H. L.	NAG 8-722	3168
13	DUKE UNIVERSITY	Castles, S. H.	GSFC	Meyer, H.	NAG 5-379	4757
13	FISK UNIVERSITY	Randall, J. L.	MSFC	Silberman, E.	NAG 8-25	5489
13	FISK UNIVERSITY	Randall, J. L.	MSFC	Silberman, E.	NAG 8-113	5490
13	FLORIDA A&M UNIV	Temkin, A.	GSFC	Weatherford, C. A.	NAG 5-738	2712
13	FLORIDA INST OF TECH	Lehoczy, S. L.	MSFC	Patterson, J. D.	NAG 8-781	2727
13	FLORIDA STATE UNIV	Mellott, M. M.	HQ-ES	Horanyi, M.	NAGW 1656	2746

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13	GEORGIA INST OF TECH	Willshire, W. L.	LARC	Pierce, A. D.	NAG 1-566	2841
13	GEORGIA INST OF TECH	Robertson, J. B.	LARC	Summers, C. J.	NAG 1-586	2842
13	GEORGIA INST OF TECH	Desch, M. D.	HQ-ES	Hayes, M. A.	NAGW 1380	2879
13	GEORGIA INST OF TECH	Owens, F. C.	HQ-XE	Hayes, M. A.	NGT 00-050-535	2901
13	HAMPTON UNIVERSITY	Meador, W. E.	LARC	Venable, D. D.	NAG 1-400	5997
13	HAMPTON UNIVERSITY	Costen, R. C.	LARC	Han, K. S.	NAG 1-441	5998
13	HAMPTON UNIVERSITY	Townsend, L. W.	LARC	Buck, W.	NAG 1-477	5999
13	HAMPTON UNIVERSITY	Wilson, J. W.	LARC	Buck, W. W.	NAG 1-656	6001
13	HAMPTON UNIVERSITY	Brockman, P.	LARC	Farrukh, U. O.	NAG 1-666	6002
13	HAMPTON UNIVERSITY	Williams Byrd, J. A.	LARC	Lowe, C.	NAG 1-827	6007
13	HAMPTON UNIVERSITY	Brockman, P.	LARC	Whitney	NAG 1-877	6008
13	HAMPTON UNIVERSITY	Williams, M. D.	LARC	Venable, D. D.	NAG 1-970	6013
13	HAMPTON UNIVERSITY	De Young, R. J.	LARC	Han, K. S.	NCC 1-137	6018
13	HAMPTON UNIVERSITY	Owens, F. C.	HQ-XE	Buck, W. W.	NGT 00-050-344	6019
13	HARVARD UNIVERSITY	Bohlin, J. D.	HQ-ES	Parkinson, W. H.	NAGW 1687	3692
13	HARVARD UNIVERSITY	Ahluwalia, H. S.	HQ-ES	Parkinson, W. H.	NGL 22-007-006	3700
13	HARVARD UNIVERSITY	Owens, F. C.	HQ-XE	Moran, J. M.	NGT 00-050-240	3706
13	HARVARD UNIVERSITY	Owens, F. C.	HQ-XE	Grindlay, J. E.	NGT 00-050-290	3707
13	HARVARD UNIVERSITY	Owens, F. C.	HQ-XE	Stanley, H. E.	NGT 00-050-300	3708
13	HARVARD UNIVERSITY	Owens, F. C.	HQ-XE	Silvera, I.	NGT 00-050-494	3710
13	HOWARD UNIVERSITY	Osantowski, J. F.	GSFC	Catchings, R. M.	NAG 5-79	2690
13	HOWARD UNIVERSITY	Yin, L. I.	GSFC	Tsang, T.	NAG 5-156	2691
13	HOWARD UNIVERSITY	Alterescu, S.	GSFC	Thorpe, A. N.	NAG 5-1057	2697
13	HOWARD UNIVERSITY	Powell, J. A.	LERC	Harris, G. L.	NAG 3-887	2689
13	INDIANA U-BLOOMINGTN	Mellott, M. M.	HQ-ES	Heinz, R. M.	NAGW 1035	3180
13	INDIANA U-BLOOMINGTN	Owens, F. C.	HQ-XE	Heinz, R. M.	NGT 00-050-298	3186
13	IOWA STATE UNIV	Clayton, G. C.	HQ-EZ	Willson, L. A.	NAGW 1364	3278
13	JOHN CARROLL UNIV	Bahmbick, R. J.	LERC	Carome, E. J.	NAG 3-984	4994
13	JOHNS HOPKINS UNIV	Early, L. J.	GSFC	Feldman, P. D.	NAG 5-619	3451
13	JOHNS HOPKINS UNIV	Wales, R.	GSFC	Lui, A. T.	NAG 5-759	3452
13	JOHNS HOPKINS UNIV	Curtis, S. A.	GSFC	Greenwald, R. A.	NAG 5-1099	3457
13	JOHNS HOPKINS UNIV	Fowler, W. S.	GSFC	Fastie, W. G.	NAS 5-25358	3477
13	JOHNS HOPKINS UNIV	Winfree, W. P.	LARC	Murphy, J. C.	NAG 1-1059	3446
13	JOHNS HOPKINS UNIV	Clayton, G. C.	HQ-EC	Krolik, J. H.	NAGW 1017	3471
13	JOHNS HOPKINS UNIV	Mellott, M. M.	HQ-EE	Potemra, T. A.	NSG 7055	3494
13	JOHNS HOPKINS UNIV	Bohlin, J. D.	HQ-ES	Rust, D. M.	NAGW 522	3465
13	JOHNS HOPKINS UNIV	Mellott, M. M.	HQ-ES	Roelof, E. C.	NAGW 773	3467
13	JOHNS HOPKINS UNIV	Mellott, M. M.	HQ-ES	Roelof, E. C.	NAGW 1578	3473
13	JOHNS HOPKINS UNIV	Mellott, M. M.	HQ-ES	Pstemra, T. A.	NAGW 1650	3474
13	JOHNS HOPKINS UNIV	Owens, F. C.	HQ-LE	Davidson, A. F.	NGT 00-050-033	3488
13	KENT STATE UNIV-KENT	Bailey, S. G.	LERC	Aburto, C. V.	NAG 3-946	4995
13	KENT STATE UNIV-KENT	Aron, P. R.	LERC	Johnson, D. L.	NAG 3-1030	4996
13	LEHIGH UNIVERSITY	Piltch, N. D.	LERC	Thompson, E. D.	NAG 3-709	5262
13	LA ST U&A&M COL-BRGE	Mellott, M. M.	HQ-ES	Wefel, J. P.	NAGW 1027	3401
13	LA ST U&A&M COL-BRGE	Mellott, M. M.	HQ-ES	Wefel, J. P.	NAGW 1247	3402
13	LA ST U&A&M COL-BRGE	Mellotte, M. M.	HQ-ES	Guzik, T. G.	NAGW 1526	3403
13	MASS INST OF TECH	Kaiser, M. L.	GSFC	Staelin, D. H.	NAG 5-537	3757
13	MASS INST OF TECH	Benson, R. F.	GSFC	Lee, M. C.	NAG 5-1055	3768
13	MASS INST OF TECH	Ormes, J. F.	GSFC	Marston, P. G.	NAG 5-1106	3772
13	MASS INST OF TECH	Mather, J.	GSFC	Weiss, R.	NAS 5-27591	3833
13	MASS INST OF TECH	Chang, F.	JSC	Yan, T. F.	NAS 9-17377	3847
13	MASS INST OF TECH	Hess, R. V.	LARC	Jenssen, H. P.	NAG 1-924	3721
13	MASS INST OF TECH	Welch, S.	LARC	Warde, C.	NAG 1-996	3724
13	MASS INST OF TECH	Kolecki, J. C.	LERC	Hastings, D. E.	NAG 3-681	3737
13	MASS INST OF TECH	Asrar, G.	HQ-EE	Kong, J. A.	NAGW 1617	3823
13	MASS INST OF TECH	Mellott, M. M.	HQ-EE	Lazarus, A. J.	NGL 22-009-015	3857
13	MASS INST OF TECH	Mellott, M. M.	HQ-ES	Chang, T. S.	NAGW 1532	3819
13	MASS INST OF TECH	Mellott, M. M.	HQ-ES	Lazarus, A. J.	NAGW 1550	3821
13	MASS INST OF TECH	Clayton, G. C.	HQ-EZ	Joss, P. C.	NAGW 1320	3812
13	MASS INST OF TECH	Owens, F. C.	HQ-XE	Binzel, R.	NGT 00-050-323	3871

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13	MASS INST OF TECH	Owens, F. C.	HQ-LE	Meyer, S.	NGT 00-050-039	3862
13	MASS INST OF TECH	Owens, F. C.	HQ-LE	Jordan, T. H.	NGT 00-050-045	3863
13	MASS INST OF TECH	Owens, F. C.	HQ-LE	Jordan, T. H.	NGT 00-050-101	3865
13	MASS INST OF TECH	Owens, F. C.	HQ-LE	Solomon, S. C.	NGT 00-050-103	3866
13	MIAMI UNIVERSITY	Meador, W. E.	LARC	Wells, W.	NCC 1-113	5001
13	MIAMI UNIVERSITY	Leonard, R. F.	LERC	Julian, G. M.	NAG 3-847	4998
13	MIAMI UNIVERSITY	Owens, F. C.	HQ-XE	Wells, W.	NGT 00-070-097	5003
13	MICHIGAN STATE UNIV	Gaier, J.	LERC	Solin, S. A.	NAG 3-595	3959
13	MICHIGAN STATE UNIV	Power, J. L.	LERC	Smussen, J. A.	NAG 3-760	3961
13	MICHIGAN STATE UNIV	Bohlin, J. D.	HQ-ES	Stein, R. F.	NAGW 1695	3966
13	NEW MEX ST U-LAS CR	Mellott, M. M.	HQ-ES	Golden, R. L.	NAGW 1418	4390
13	NORFOLK STATE UNIV	Barnes, J. C.	LARC	Miller, G. E.	NAG 1-845	6024
13	NORFOLK STATE UNIV	Long, S. T.	LARC	Ferguson, M. W.	NCC 1-115	6026
13	NO CAR A&T STATE U	Hoell, J. M.	LARC	Yu, C.	NAG 1-815	4773
13	NO CAROLINA STATE U	Jones, F. C.	GSFC	Ellison, D. C.	NAG 5-1042	4797
13	NO CAROLINA STATE U	Jones, F. C.	GSFC	Ellison, D. C.	NAG 5-1131	4798
13	NORTHEASTERN UNIV	Grimaud, J. E.	JSC	Willey, R. J.	NAG 9-260	3892
13	NORTHEASTERN UNIV	Stearns, C. A.	LERC	Vittoria, C.	NAG 3-745	3891
13	NORTHEASTERN UNIV	Mellott, M. M.	HQ-ES	Chan, C.	NAGW 1572	3894
13	NORTHWESTERN UNIV	Clayton, G. C.	HQ-EZ	Taam, R. E.	NAGW 768	3008
13	OBERLIN COLLEGE	Alterovitz, S.	LERC	Scofield, J. H.	NAG 3-885	5004
13	OHIO STATE UNIV	Chackerian, C.	ARC	Rao, K. N.	NCA 2-154	5051
13	OHIO STATE UNIV	Chackerian Jr. 1, C.	ARC	Rao, K. N.	NCA 2-379	5056
13	OHIO STATE UNIV	Marsh, J. G.	GSFC	Rapp, R. H.	NAG 5-781	5038
13	OHIO STATE UNIV	Mantenieks, M. A.	LERC	York, T. M.	NAG 3-843	5024
13	OHIO STATE UNIV	Wilkinson, R. A.	LERC	Stroud, D. G.	NAG 3-999	5032
13	OKLAHOMA STATE UNIV	Brockman, P.	LARC	Powell, R. C.	NAG 1-694	5178
13	OKLAHOMA STATE UNIV	Owens, F. C.	HQ-XE	Martin, J.	NGT 00-070-092	5181
13	OLD DOMINION UNIV	Costen, R. C.	LARC	Heinbockel, J. H.	NAG 1-757	6043
13	OLD DOMINION UNIV	Byvik, C. E.	LARC	Albin, S.	NAG 1-791	6045
13	OLD DOMINION UNIV	Brockman, P.	LARC	Swetits, J.	NAG 1-957	6057
13	OLD DOMINION UNIV	Greene, G. C.	LARC	Ash, R. L.	NAG 1-987	6060
13	OLD DOMINION UNIV	Greene, G. C.	LARC	Kandil, O. A.	NAG 1-994	6061
13	OLD DOMINION UNIV	Townsend, L. W.	LARC	Khandelwal, G. S.	NCC 1-42	6069
13	OLD DOMINION UNIV	Long, S. T.	LARC	Harries, W. L.	NCC 1-90	6071
13	OLD DOMINION UNIV	Melfi, L. T., Jr.	LARC	Brock, F. J.	NCC 1-94	6072
13	OLD DOMINION UNIV	Meador, W. E.	LARC	Harries, W. L.	NSG 1568	6097
13	PENN STATE U-UNIV PK	McAninch, G.	LARC	Pierce, A. D.	NAG 1-947	5282
13	PENN STATE U-UNIV PK	Mellott, M. M.	HQ-ES	Nisbet, J. S.	NGL 39-009-003	5357
13	PITZER COL	Mellott, M. M.	HQ-ES	Higdon, J. C.	NAGW 1297	1627
13	POLYTECHNIC U	Benson, R. F.	GSFC	Kuo, S. P.	NAG 5-1051	4619
13	POLYTECHNIC U	Fripp, A. L.	LARC	Schleich, D. M.	NAG 1-888	4616
13	PRAIRIE VIEW A&M U	Parish, R.	JSC	Boyd, R. D.	NAG 9-310	5568
13	PRINCETON UNIVERSITY	Early, L. J.	GSFC	Jenkins, E. B.	NAG 5-616	4333
13	PRINCETON UNIVERSITY	Chai, A. T.	LERC	Saville, D. A.	NAG 3-259	4324
13	PRINCETON UNIVERSITY	Ross, H. D.	LERC	Ronney, P. D.	NAG 3-965	4328
13	PRINCETON UNIVERSITY	Mellott, M. M.	HQ-ES	Okuda, H.	NAGW 1606	4346
13	PRINCETON UNIVERSITY	Gillett, F. C.	HQ-EZ	Wilkinson, D. T.	NAGW 1482	4345
13	PURDUE UNIVERSITY	Jaffe, R. L.	ARC	Grant, E. R.	NAG 2-468	3199
13	RENSSELAER POLY-NY	McAninch, G. L.	LARC	Jacobson, M. J.	NAG 1-929	4625
13	RENSSELAER POLY-NY	Owens, F. C.	HQ-XE	Schowalter, L. J.	NGT 00-050-430	4649
13	RICE UNIVERSITY	Acuna, M. H.	GSFC	Cloutier, P. A.	NAG 5-1195	5581
13	RICE UNIVERSITY	Visentine, J. T.	JSC	Smith, K. A.	NAG 9-209	5589
13	RICE UNIVERSITY	Mellott, M. M.	HQ-ES	Dessler, A. J.	NAGW 1151	5599
13	RICE UNIVERSITY	Mellott, M. M.	HQ-ES	Dessler, A. J.	NAGW 1416	5600
13	RICE UNIVERSITY	Owens, F. C.	HQ-XE	Haymes, R. C.	NGT 00-050-251	5605
13	SAN FRAN STATE UNIV	Valero, F. P.	ARC	Marcy, G.	NCA 2-454	1640
13	SAN JOSE STATE UNIV	McKay, C. P.	ARC	Becker, J. F.	NCA 2-218	1651
13	SAN JOSE STATE UNIV	Chang, S.	ARC	Becker, J. F.	NCA 2-356	1654
13	SAN JOSE STATE UNIV	Borucki, W. J.	ARC	Lakkaraju, H. S.	NCA 2-382	1655

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13	SAN JOSE STATE UNIV	Toon, O. B.	ARC	Hamill, P.	NCA 2-386	1656
13	SAN JOSE STATE UNIV	Valentin, J.	ARC	Becker, J.	NCA 2-407	1658
13	SAN JOSE STATE UNIV	Owens, F. C.	HQ-XE	Becker, J. F.	NGT 00-070-069	1682
13	STANFORD UNIVERSITY	Kittel, P.	ARC	Fairbanks, W. M.	NAG 2-276	1699
13	STANFORD UNIVERSITY	Early, L. J.	GSFC	Timothy, J. G.	NAG 5-622	1712
13	STANFORD UNIVERSITY	Stich, K.	GSFC	Sherrer, P.	NAS 5-30386	1750
13	STANFORD UNIVERSITY	Stich, K.	GSFC	Timothy, J. G.	NAS 5-30387	1751
13	STANFORD UNIVERSITY	Early, L. J.	GSFC	Walker, A. B.	NSG 5131	1859
13	STANFORD UNIVERSITY	Barnes, N. P.	LARC	Feigelson, R. S.	NAG 1-698	1692
13	STANFORD UNIVERSITY	Barnes, N.	LARC	Byer, R. L.	NAG 1-828	1693
13	STANFORD UNIVERSITY	Newcomb, A. L.	LARC	Byer, R. L.	NAG 1-839	1694
13	STANFORD UNIVERSITY	Fripp, A. L.	LARC	Spicer, W. E.	NAG 1-851	1695
13	STANFORD UNIVERSITY	Poe, C.	LARC	Springer, G. S.	NAS 1-18778	1746
13	STANFORD UNIVERSITY	Decker, R.	MSFC	Ereritt, C. W.	NAG 8-26	1718
13	STANFORD UNIVERSITY	Havrisik, D.	MSFC	Michelson, P. F.	NAG 8-710	1719
13	STANFORD UNIVERSITY	Hill, H.	MSFC	Banks, P. M.	NAS 8-35350	1752
13	STANFORD UNIVERSITY	Ise, R.	MSFC	Everitt, C. W.	NAS 8-36125	1753
13	STANFORD UNIVERSITY	Mellott, M. M.	HQ-ES	Spreiter, J. R.	NAGW 278	1728
13	STANFORD UNIVERSITY	Bohlin, J. D.	HQ-ES	Timothy, J. G.	NAGW 540	1731
13	STANFORD UNIVERSITY	Mellott, M. M.	HQ-ES	Banks, P. M.	NAGW 1566	1739
13	STANFORD UNIVERSITY	Mellott, M. M.	HQ-ES	Inan, U. S.	NAGW 1582	1740
13	STANFORD UNIVERSITY	Mellott, M. M.	HQ-ES	Vesecky, J. F.	NAGW 1634	1741
13	STANFORD UNIVERSITY	Mellott, M. M.	HQ-ES	Helliwell, R. A.	NAGW 1680	1742
13	STANFORD UNIVERSITY	Bohlin, J. D.	HQ-ES	Walker, A. B.	NAGW 1749	1743
13	STANFORD UNIVERSITY	Mellott, M. M.	HQ-ES	Spreiter, J. R.	NAGW 1790	1745
13	STANFORD UNIVERSITY	Bohlin, J. D.	HQ-ES	Sturrock, P. A.	NGL 05-020-272	1835
13	STANFORD UNIVERSITY	Stachnik, R. V.	HQ-EZ	Timothy, J. G.	NASW 4093	1756
13	STANFORD UNIVERSITY	Owens, F. C.	HQ-XE	Petrocian, V.	NGT 00-050-347	1844
13	STANFORD UNIVERSITY	Owens, F. C.	HQ-XE	Banks, P.	NGT 00-050-383	1847
13	STANFORD UNIVERSITY	Owens, F. C.	HQ-XE	Hesselink, L.	NGT 00-050-488	1852
13	STANFORD UNIVERSITY	Owens, F. C.	HQ-LE	Timothy, J. G.	NGT 00-050-035	1840
13	STANFORD UNIVERSITY	Wander, S. M.	HQ-RF	Chapman, D. R.	NAGW 965	1733
13	STATE UNIV NY-BUFFAL	Long, S. T.	LARC	Rustgi, M. L.	NAG 1-577	4685
13	STATE UNIV NY-BUFFAL	Wander, S. M.	HQ-RF	George, W.	NAGW 966	4695
13	STATE U NY-STONY BRK	Fimmel, R. O.	ARC	Fox, J. L.	NAG 2-329	4703
13	TEXAS A&I UNIVERSITY	Deloach, R.	LARC	Coy, P. H.	NAG 1-1010	5616
13	TEXAS A&M UNIVERSITY	McCoy, J. E.	JSC	Hite, G.	NAG 9-266	5657
13	TEXAS A&M UNIVERSITY	Willshire, W. L.	LARC	Alexander, R. M.	NAG 1-911	5632
13	TEXAS A&M UNIVERSITY	Owens, F. C.	HQ-XE	Poston, J.	NGT 00-050-380	5690
13	TEXAS CHRISTIAN UNIV	Jalufka, N. W.	LARC	Blount, C. E.	NAG 1-691	5701
13	TOWSON STATE UNIV	Balasubrahmanya, V. K.	GSFC	Huang, J. W.	NAG 5-733	3502
13	TUFTS UNIVERSITY	Bullock, G. D.	GSFC	Lang, K. R.	NAG 5-501	3897
13	TUSKEGEE UNIVERSITY	Randall, I. L.	MSFC	Jeelani, S.	NAG 8-68	1064
13	TUSKEGEE UNIVERSITY	Randall, J. L.	MSFC	Harris, V. G.	NAG 8-77	1065
13	UNION COLLEGE	Donn, B. D.	GSFC	Peak, D.	NAG 5-938	4743
13	UNIV OF AKRON	Abel, P. B.	LERC	Henriksen, P. N.	NAG 3-813	5090
13	UNIV OF AKRON	Glasgow, T. K.	LERC	Cheung, H. M.	NAG 3-906	5095
13	UNIV ALA-BIRMINGHAM	Szofran, F. R.	MSFC	Andrews, R. N.	NAG 8-685	1075
13	UNIV ALA-BIRMINGHAM	Curreri, P. A.	MSFC	Andrews, B. J.	NAG 8-768	1078
13	UNIV ALA-BIRMINGHAM	Gillett, F. C.	HQ-EZ	Wdowiak, T. J.	NAGW 749	1079
13	UNIV ALA-BIRMINGHAM	Owens, F. C.	HQ-LE	Agosti, D. G.	NGT 02-002-802	1087
13	UNIV ALA-HUNTSVILLE	Bullock, G. D.	GSFC	Emslie, A. G.	NAG 5-500	1089
13	UNIV ALA-HUNTSVILLE	Fripp, A. L.	LARC	Rosenberger, F.	NAG 1-972	1088
13	UNIV ALA-HUNTSVILLE	Leslie, F.	MSFC	Hung, R. J.	NAG 8-35	1092
13	UNIV ALA-HUNTSVILLE	Chappel, C. R.	MSFC	Torbert, R. B.	NAG 8-56	1095
13	UNIV ALA-HUNTSVILLE	Chappel, C. R.	MSFC	Wu, S. T.	NAG 8-58	1096
13	UNIV ALA-HUNTSVILLE	Parnoll, T. A.	MSFC	Gregory, J. C.	NAG 8-65	1099
13	UNIV ALA-HUNTSVILLE	Frazier, D. O.	MSFC	Loo, B. H.	NAG 8-89	1103
13	UNIV ALA-HUNTSVILLE	Kroes, R. L.	MSFC	Nyce, T. A.	NAG 8-98	1107
13	UNIV ALA-HUNTSVILLE	Eskridge, R. H.	MSFC	Hung, R. J.	NAG 8-102	1109

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13	UNIV ALA-HUNTSVILLE	Fields, S.	MSFC	Comfort, R. H.	NAG 8-122	1112
13	UNIV ALA-HUNTSVILLE	Chisholm, W. L.	MSFC	Comfort, R. H.	NAG 8-134	1115
13	UNIV ALA-HUNTSVILLE	Roberts, W. T.	MSFC	Wu, S. T.	NAG 8-682	1122
13	UNIV ALA-HUNTSVILLE	Bass, B. G.	MSFC	Rosenberger, F.	NAG 8-684	1123
13	UNIV ALA-HUNTSVILLE	Chandler, M. O.	MSFC	Comfort, R. H.	NAG 8-692	1125
13	UNIV ALA-HUNTSVILLE	Lehoczy, S. L.	MSFC	Anderson, E. E.	NAG 8-767	1136
13	UNIV ALA-HUNTSVILLE	Parnell, T. A.	MSFC	Takahashi, Y.	NAS 8-35354	1155
13	UNIV ALA-HUNTSVILLE	Lee, J. E.	MSFC	Workman, G. L.	NAS 8-36485	1161
13	UNIV ALA-HUNTSVILLE	Fields, S. A.	MSFC	Torbert, R. B.	NAS 8-37348	1170
13	UNIV ALA-HUNTSVILLE	Parnell, T. A.	MSFC	Gregory, J.	NAS 8-37751	1174
13	UNIV ALA-HUNTSVILLE	Stone, J. F.	MSFC	Torbert, R. B.	NAS 8-37886	1175
13	UNIV ALA-HUNTSVILLE	Alexander, J. K.	HQ-E	Torbert, R. B.	NAGW 1586	1149
13	UNIV ALA-HUNTSVILLE	Ahluwalia, H. S.	HQ-ES	Wu, S. T.	NAGW 9	1139
13	UNIV ALA-HUNTSVILLE	Ahluwalia, H. S.	HQ-ES	Emslie, A. G.	NAGW 294	1140
13	UNIV ALA-HUNTSVILLE	Mellott, M. M.	HQ-ES	Torr, D. G.	NAGW 922	1143
13	UNIV ALA-HUNTSVILLE	Mellott, M. M.	HQ-ES	Richards, P. G.	NAGW 996	1144
13	UNIV ALA-HUNTSVILLE	Mellott, M. M.	HQ-ES	Horwitz, J. L.	NAGW 1554	1147
13	UNIV ALA-HUNTSVILLE	Mellott, M. M.	HQ-ES	Comfort, R. H.	NAGW 1630	1150
13	UNIV ALA-HUNTSVILLE	Mellott, M. M.	HQ-ES	Takahashi, Y.	NAGW 1651	1151
13	UNIV ALA-HUNTSVILLE	Owens, F. C.	HQ-XE	Torr, D. G.	NGT 00-050-355	1188
13	UNIV ALA-HUNTSVILLE	Owens, F. C.	HQ-LE	Emslie, A. G.	NGT 00-050-044	1184
13	UNIV ALA-HUNTSVILLE	Owens, F. C.	HQ-LE	Anderson, E. E.	NGT 00-050-124	1185
13	UNIV ALASKA-FAIRBNKS	Ledley, B. G.	GSFC	Hallinan, T. J.	NAG 5-1074	1202
13	UNIV ALASKA-FAIRBNKS	Curtis, S. A.	GSFC	Rees, M. H.	NAG 5-1097	1203
13	UNIV ALASKA-FAIRBNKS	Mellott, M. M.	HQ-EE	Kan, J. R.	NAGW 1249	1211
13	UNIV ALASKA-FAIRBNKS	Mellott, M. M.	HQ-EE	Kan, J. R.	NAGW 1250	1212
13	UNIV ALASKA-FAIRBNKS	Mellott, M. M.	HQ-ES	Kan, J. R.	NAGW 906	1207
13	UNIV ALASKA-FAIRBNKS	Mellott, M. M.	HQ-ES	Roederer, J. G.	NAGW 1342	1213
13	UNIV ALASKA-FAIRBNKS	Mellott, M. M.	HQ-ES	Akasofu, S. I.	NAGW 1520	1214
13	UNIV ALASKA-FAIRBNKS	Mellott, M. M.	HQ-ES	Swift, D. W.	NAGW 1787	1216
13	UNIV ALASKA-FAIRBNKS	Owens, F. C.	HQ-XE	Weeks, W. F.	NGT 00-050-534	1223
13	UNIV OF ARIZONA	Early, L. J.	GSFC	Ksieh, K. C.	NAG 5-625	1313
13	UNIV OF ARIZONA	Early, L. J.	GSFC	Broadfoot, A. L.	NAG 5-637	1314
13	UNIV OF ARIZONA	Balasubrahmanya, V. K.	GSFC	Bowen, T.	NAG 5-831	1317
13	UNIV OF ARIZONA	Ormes, J. F.	GSFC	Bowen, T.	NAG 5-879	1320
13	UNIV OF ARIZONA	Townsend, L. W.	LARC	Ganapol, B. D.	NAG 1-919	1286
13	UNIV OF ARIZONA	Wilson, J. W.	LARC	Ganapol, B. D.	NAG 1-1041	1287
13	UNIV OF ARIZONA	Arrison, A.	LERC	Stegeman, G. I.	NAG 3-392	1302
13	UNIV OF ARIZONA	Frederick, J.	MSFC	Ramohalli, K. N.	NAG 8-694	1335
13	UNIV OF ARIZONA	Christian, H. J.	MSFC	Krider, E. P.	NAS 8-36477	1424
13	UNIV OF ARIZONA	Mellot, M. M.	HQ-EE	Hood, L. L.	NAGW 962	1368
13	UNIV OF ARIZONA	Evans, L. G.	HQ-EL	Fan, C. Y.	NAGW 1097	1374
13	UNIV OF ARIZONA	Quaide, W. L.	HQ-EL	Smith, B. A.	NAGW 1376	1396
13	UNIV OF ARIZONA	Evans, L. G.	HQ-EL	Broadfoot, A. L.	NASW 4245	1428
13	UNIV OF ARIZONA	Owens, F. C.	HQ-XE	Shemansky, D. E.	NGT 00-050-303	1457
13	UNIV OF ARIZONA	Owens, F. C.	HQ-XE	Holberg, J. B.	NGT 00-050-305	1458
13	UNIV OF ARIZONA	Owens, F. C.	HQ-XE	Low, F.	NGT 00-050-382	1462
13	UNIV OF ARIZONA	Owens, F. C.	HQ-LE	Fink, U.	NGT 00-050-027	1443
13	UNIV ARKANSAS-LTL RK	Mogan, P.	KSC	Adams, A.	NAS10-11604	1491
13	UNIV CALIF-BERKELEY	Early, L. J.	GSFC	Chakrabarti, S.	NAG 5-646	1879
13	UNIV CALIF-BERKELEY	Early, L. J.	GSFC	Carlson, C. W.	NAG 5-657	1880
13	UNIV CALIF-BERKELEY	Early, L. J.	GSFC	Chakrabarti, S.	NAG 5-660	1881
13	UNIV CALIF-BERKELEY	Acuna, M. H.	GSFC	Lin, R. P.	NAG 5-959	1883
13	UNIV CALIF-BERKELEY	Wainscott, F. H.	GSFC	Mozer, F. S.	NAS 5-26847	1924
13	UNIV CALIF-BERKELEY	Wainscott, F.	GSFC	Lin, R. P.	NAS 5-26855	1925
13	UNIV CALIF-BERKELEY	Wainscott, F.	GSFC	Mozer, F. S.	NAS 5-30241	1930
13	UNIV CALIF-BERKELEY	Wainscott, F.	GSFC	Lin, R.	NAS 5-30366	1931
13	UNIV CALIF-BERKELEY	Wainscott, F. H.	GSFC	Mozer, F. S.	NAS 5-30367	1932
13	UNIV CALIF-BERKELEY	Stich, K.	GSFC	Mozer, F. S.	NAS 5-30396	1933
13	UNIV CALIF-BERKELEY	Browne, I. D.	JSC	Reynolds, J. H.	NAG 9-34	1893

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13	UNIV CALIF-BERKELEY	Chai, A. T.	LERC	Concus, P.	NAG 3-146	1871
13	UNIV CALIF-BERKELEY	Alexander, J. A.	HQ-E	McKee, C. F.	NGL 05-003-497	1969
13	UNIV CALIF-BERKELEY	Rummel, J. D.	HQ-EB	Betz, A. L.	NAGW 681	1901
13	UNIV CALIF-BERKELEY	Fox, K.	HQ-EL	De Pater, I.	NAGW 776	1902
13	UNIV CALIF-BERKELEY	Mellott, M. M.	HQ-ES	Crawford, H. J.	NAGW 1503	1911
13	UNIV CALIF-BERKELEY	Mellott, M. M.	HQ-ES	Carlson, C. W.	NAGW 1565	1914
13	UNIV CALIF-BERKELEY	Mellott, M. M.	HQ-ES	Stenzel, R. L.	NAGW 1570	1915
13	UNIV CALIF-BERKELEY	Mellott, M. M.	HQ-ES	Mozer, F. S.	NAGW 1626	1917
13	UNIV CALIF-BERKELEY	Mellott, M. M.	HQ-ES	Anderson, K. A.	NAGW 1795	1920
13	UNIV CALIF-BERKELEY	Ahluwalia, H. S.	HQ-EZ	Lin, R. P.	NAGW 516	1898
13	UNIV CALIF-BERKELEY	Owens, F. C.	HQ-XE	Mozer, F. C.	NGT 00-050-178	1981
13	UNIV CALIF-BERKELEY	Owens, F. C.	HQ-XE	Richards, P. L.	NGT 00-050-179	1982
13	UNIV CALIF-BERKELEY	Owens, F. C.	HQ-XE	Larson, D. E.	NGT 00-050-271	1984
13	UNIV CALIF-BERKELEY	Owens, F. C.	HQ-XE	Lange, A. E.	NGT 00-050-312	1987
13	UNIV CALIF-BERKELEY	Owens, F. C.	HQ-XE	Anderson, K. A.	NGT 00-050-313	1988
13	UNIV CALIF-BERKELEY	Owens, F. C.	HQ-XE	Sutton, E. C.	NGT 00-050-450	1990
13	UNIV CALIF-BERKELEY	Owens, F. C.	HQ-XE	Mozer, F. S.	NGT 00-050-451	1991
13	UNIV CALIF-BERKELEY	Owens, F. C.	HQ-XE	Chakrabarti, S.	NGT 00-050-452	1992
13	UNIV CALIF-BERKELEY	Owens, F. C.	HQ-XE	Price, P. B.	NGT 00-050-454	1993
13	UNIV CALIF-BERKELEY	Owens, F. C.	HQ-XE	Kahn, S. M.	NGT 00-050-467	1995
13	UNIV CALIF-BERKELEY	Owens, F. C.	HQ-XE	Stark, L.	NGT 00-070-034	1996
13	UNIV CALIF-BERKELEY	Owens, F. C.	HQ-LE	Price, P. B.	NGT 00-050-014	1975
13	UNIV CALIF-BERKELEY	Owens, F. C.	HQ-LE	Betz, A. L.	NGT 00-050-018	1977
13	UNIV CALIF-BERKELEY	Owens, F. C.	HQ-LE	Sadoulet, B.	NGT 00-050-022	1978
13	UNIV CALIF-IRVINE	Hollenbach, D.	ARC	Garden, R. P.	NCA 2-391	2055
13	UNIV CALIF-IRVINE	Curtis, S. A.	HQ-ES	Hoven, G. V.	NAGW 93	2048
13	UNIV CALIF-IRVINE	Ahluwalia, H. S.	HQ-EZ	Van Hoven, G.	NSG 7375	2057
13	UNIV CALIF-L ANGELES	Lee, J. M.	ARC	Frederking, T. H.	NAG 2-516	2069
13	UNIV CALIF-L ANGELES	Curtis, S. A.	GSFC	Russell, C. T.	NAG 5-536	2075
13	UNIV CALIF-L ANGELES	Curtis, S. A.	GSFC	Strongway, R. J.	NAG 5-863	2079
13	UNIV CALIF-L ANGELES	Curtis, S. A.	GSFC	Abdalla, M. A.	NAG 5-1100	2084
13	UNIV CALIF-L ANGELES	Acuna, M.	GSFC	Kivelson, M. G.	NAG 5-1167	2086
13	UNIV CALIF-L ANGELES	O'brien, J. J.	GSFC	McPherron, R. L.	NAS 5-26852	2126
13	UNIV CALIF-L ANGELES	O'brien, J. J.	GSFC	Ashour-abdalla G, M.	NAS 5-26871	2127
13	UNIV CALIF-L ANGELES	Theis, R. F.	HQ-EE	Scarf, F. L.	NAGW 995	2105
13	UNIV CALIF-L ANGELES	Bergstralh, J. T.	HQ-EL	Luhmann, J. G.	NAGW 1347	2114
13	UNIV CALIF-L ANGELES	Brinton, H. C.	HQ-EL	Luhmann, J. G.	NAGW 1379	2115
13	UNIV CALIF-L ANGELES	Quaide, W.	HQ-EL	Russell, C. T.	NAGW 1753	2122
13	UNIV CALIF-L ANGELES	Bohlin, J. D.	HQ-ES	Ulrich, R.	NAGW 472	2101
13	UNIV CALIF-L ANGELES	Mellott, M. M.	HQ-ES	Omidi, N.	NAGW 1227	2113
13	UNIV CALIF-L ANGELES	Mellott, M. M.	HQ-ES	Barbosa, D. D.	NAGW 1558	2116
13	UNIV CALIF-L ANGELES	Mellott, M. M.	HQ-ES	Kennel, C. F.	NAGW 1624	2117
13	UNIV CALIF-L ANGELES	Mellott, M. M.	HQ-ES	Elphic, R. C.	NAGW 1633	2118
13	UNIV CALIF-L ANGELES	Mellott, M. M.	HQ-ES	Maggs, J. E.	NAGW 1635	2119
13	UNIV CALIF-L ANGELES	Mellott, M. M.	HQ-ES	Thorne, R. M.	NAGW 1639	2120
13	UNIV CALIF-L ANGELES	Mellott, M. M.	HQ-ES	Dawson, J. M.	NAGW 1649	2121
13	UNIV CALIF-L ANGELES	Owens, F. C.	HQ-XE	Stenzel, R. L.	NGT 00-050-247	2151
13	UNIV CALIF-L ANGELES	Owens, F. C.	HQ-LE	Wong, A. Y.	NGT 05-006-800	2156
13	UNIV CALIF-SAN DIEGO	O'brien, J. J.	GSFC	McIlwain, C. E.	NAS 5-26854	2233
13	UNIV CALIF-SAN DIEGO	Stich, K.	GSFC	McIlwain, C.	NAS 5-30378	2238
13	UNIV CALIF-SAN DIEGO	Mellott, M. M.	HQ-ES	Whipple, E. C.	NAGW 1150	2219
13	UNIV CALIF-SAN DIEGO	Mellott, M. M.	HQ-ES	Quest, K. B.	NAGW 1712	2226
13	UNIV CALIF-SAN DIEGO	Mellott, M. M.	HQ-ES	Omidi, N.	NAGW 1806	2228
13	UNIV CALIF-SAN DIEGO	Desch, M. D.	HQ-ES	McIlwain, C. E.	NGL 05-005-007	2251
13	UNIV CALIF-SAN DIEGO	Bohlin, J. D.	HQ-ES	Hudson, H. S.	NSG 7161	2264
13	UNIV CALIF-SAN DIEGO	Spicer, D. S.	HQ-EZ	Hudson, H. S.	NAGW 585	2206
13	UNIV CALIF-SAN DIEGO	Owens, F. C.	HQ-XE	Lee, S. H.	NGT 00-050-159	2256
13	UNIV CALIF-SAN DIEGO	Owens, F. C.	HQ-XE	Agnew, D. C.	NGT 00-050-160	2257
13	UNIV CALIF-SAN DIEGO	Owens, F. C.	HQ-XE	Matteson, J. L.	NGT 00-050-175	2259
13	UNIV CALIF-SAN DIEGO	Owens, F. C.	HQ-XE	Puetter, R.	NGT 00-070-138	2263

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13	UNIV CALIF-SAN DIEGO	Owens, F. C.	HQ-LE	McIlwain, C. E.	NGT 00-050-131	2254
13	UNIV CALIF-SAN FRAN	White, R.	HQ-EB	Benton, E. V.	NAGW 891	2271
13	UNIV CALIF-S BARBARA	Owens, F. C.	HQ-XE	Lubin, P. M.	NGT 00-050-192	2305
13	UNIV CALIF-S CRUZ	Clayton, G.	HQ-EZ	Woosley, S. E.	NAGW 1273	2312
13	UNIV OF CHICAGO	Lasher, L. E.	ARC	Simpson, J. A.	NAG 2-380	3021
13	UNIV OF CHICAGO	Wales, R. O.	GSFC	Werdenbock, M. E.	NAG 5-308	3024
13	UNIV OF CHICAGO	Browne, I. D.	JSC	Smith, J. V.	NAG 9-47	3034
13	UNIV OF CHICAGO	Mellott, M. M.	HQ-ES	Muller, D.	NAGW 1311	3048
13	UNIV OF CHICAGO	Mellott, M. M.	HQ-ES	Meyer, P.	NAGW 1328	3050
13	UNIV OF CHICAGO	Mellott, M. M.	HQ-ES	Rosner, R.	NAGW 1640	3055
13	UNIV OF CHICAGO	Bohlin, J. D.	HQ-ES	Rosner, R.	NAGW 1685	3056
13	UNIV OF CHICAGO	Clayton, G. C.	HQ-EZ	Lamb, D. Q.	NAGW 1284	3047
13	UNIV OF CHICAGO	Clayton, G. C.	HQ-EZ	Hobbs, L. M.	NAGW 1475	3051
13	UNIV OF CHICAGO	Owens, F. C.	HQ-XE	Meyer, P.	NGT 00-050-199	3080
13	UNIV OF CHICAGO	Owens, F. C.	HQ-XE	Clayton, R. N.	NGT 00-050-203	3081
13	UNIV OF CHICAGO	Owens, F. C.	HQ-XE	Turner, M. S.	NGT 00-050-209	3082
13	UNIV OF CHICAGO	Owens, F. C.	HQ-XE	Miller, R. H.	NGT 00-050-348	3084
13	UNIV OF CHICAGO	Owens, F. C.	HQ-XE	Turner, M. S.	NGT 00-050-453	3086
13	UNIV OF CHICAGO	Owens, F. C.	HQ-XE	Turner, M. S.	NGT 00-050-469	3088
13	UNIV OF CHICAGO	Owens, F. C.	HQ-LE	Simpson, J. A.	NGT 14-020-801	3089
13	UNIV OF CHICAGO	Owens, F. C.	HQ-LE	Wiedenbeck, M.	NGT 14-020-802	3090
13	UNIV OF CINCINNATI	Beheim, G.	LERC	Boyd, J. T.	NAG 3-852	5118
13	UNIV COLORADO-BOLDR	Early, L. J.	GSFC	Rottman, G. J.	NAG 5-633	2427
13	UNIV COLORADO-BOLDR	Early, L. J.	GSFC	Woods, T. N.	NAG 5-652	2428
13	UNIV COLORADO-BOLDR	Ormes, J. A.	GSFC	Jordan, S.	NAG 5-960	2440
13	UNIV COLORADO-BOLDR	Ogilvie, K. W.	GSFC	Lawrence, G. M.	NAG 5-1104	2446
13	UNIV COLORADO-BOLDR	McLennan, D.	GSFC	Rottman, G. G.	NAS 5-30683	2526
13	UNIV COLORADO-BOLDR	Alexander, J. K.	HQ-E	Bender, P. L.	NAGW 822	2473
13	UNIV COLORADO-BOLDR	Theis, R. F.	HQ-EE	Dusenberg, P. B.	NAGW 998	2478
13	UNIV COLORADO-BOLDR	Brinton, H. C.	HQ-EL	Esposito, L. W.	NAGW 1440	2500
13	UNIV COLORADO-BOLDR	Mellott, M. M.	HQ-ES	Speiser, T.	NAGW 1054	2480
13	UNIV COLORADO-BOLDR	Mellott, M. M.	HQ-ES	Speiser, T. W.	NAGW 1176	2488
13	UNIV COLORADO-BOLDR	Bohlin, J. D.	HQ-ES	Kiplinger, A. L.	NAGW 1462	2501
13	UNIV COLORADO-BOLDR	Mellott, M. M.	HQ-ES	Winglee, R. W.	NAGW 1587	2505
13	UNIV COLORADO-BOLDR	Mellott, M. M.	HQ-ES	Speiser, T.	NAGW 1593	2506
13	UNIV COLORADO-BOLDR	Mellott, M. M.	HQ-ES	Bagenal, F.	NAGW 1622	2508
13	UNIV COLORADO-BOLDR	Bohlin, J. D.	HQ-ES	Linski, J. L.	NAGW 1716	2509
13	UNIV COLORADO-BOLDR	Bohlin, J. D.	HQ-ES	Dulk, G. A.	NSG 7287	2568
13	UNIV COLORADO-BOLDR	Ahluwalia, H. S.	HQ-EZ	Linsky, J. L.	NGL 06-003-057	2540
13	UNIV COLORADO-BOLDR	Spicer, D. S.	HQ-EZ	Toomre, J.	NSG 7511	2569
13	UNIV COLORADO-BOLDR	Owens, F. C.	HQ-XE	Zweibel, E. G.	NGT 00-050-236	2545
13	UNIV COLORADO-BOLDR	Owens, F. C.	HQ-XE	Brandt, J. C.	NGT 00-050-326	2549
13	UNIV COLORADO-BOLDR	Owens, F. C.	HQ-XE	Rottman, G. J.	NGT 00-050-460	2554
13	UNIV COLORADO-BOLDR	Owens, F. C.	HQ-XE	Garmany, C. D.	NGT 00-050-483	2556
13	UNIV COLORADO-BOLDR	Owens, F. C.	HQ-LE	Shull, J. M.	NGT 00-050-043	2542
13	UNIV COLORADO-BOLDR	Owens, F. C.	HQ-LE	Shull, J. M.	NGT 06-003-800	2562
13	UNIV OF DELAWARE	Brinton, H. C.	HQ-EL	Ness, N. F.	NAGW 1437	2624
13	UNIV OF DELAWARE	Mellott, M. M.	HQ-ES	Mullan, D. J.	NAGW 1295	2623
13	UNIV OF DELAWARE	Mellott, M. M.	HQ-ES	Gaisser, T. K.	NAGW 1644	2626
13	UNIV OF DELAWARE	Jones, W. V.	HQ-EZ	Evenson, P.	NAGW 1040	2622
13	UNIV OF DELAWARE	Owens, F. C.	HQ-XE	Evenson, P. A.	NGT 00-050-205	2630
13	UNIV OF DELAWARE	Owens, F. C.	HQ-XE	Matthaeus, W. H.	NGT 00-050-338	2631
13	UNIV OF FLORIDA	Fripp, A. L.	LARC	Anderson, T. J.	NAG 1-609	2766
13	UNIV OF FLORIDA	Deyoung, R. J.	LARC	Chen, K. Y.	NAG 1-737	2768
13	UNIV OF HAWAII-MANOA	Bohlin, J. D.	HQ-ES	Lindsey, C.	NAGW 723	2944
13	UNIV OF HAWAII-MANOA	Bohlin, J. D.	HQ-ES	McClymont, A. N.	NAGW 864	2947
13	UNIV OF HAWAII-MANOA	Bohlin, J. D.	HQ-ES	Canfield, R. C.	NAGW 1454	2959
13	UNIV OF HAWAII-MANOA	Bohlin, J. D.	HQ-ES	Canfield, R. C.	NAGW 1542	2962
13	UNIV OF HAWAII-MANOA	Bohlin, J. D.	HQ-ES	Labonte, B. J.	NAGW 1698	2964
13	UNIV OF HAWAII-MANOA	Bohlin, J. D.	HQ-ES	Orrall, F. Q.	NAGW 1699	2965

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13	UNIV OF HAWAII-MANOA	Stachnik, R. V.	HQ-EZ	Hall, D. N.	NAGW 755	2945
13	UNIV OF HAWAII-MANOA	Owens, F. C.	HQ-XE	Kari, D.	NGT 00-050-291	2978
13	UNIV HOUSTON-HOUSTON	Santos-mason, B.	JSC	Ignatiev, A.	NAG 9-180	5715
13	UNIV ILLINOIS-URBANA	Werner, M. W.	ARC	Lamb, S. A.	NCA 2-368	3144
13	UNIV ILLINOIS-URBANA	Mirtich, M. J.	LERC	Thornton, J.	NAG 3-591	3118
13	UNIV ILLINOIS-URBANA	Owens, F. C.	HQ-XE	Lamb, S. A.	NGT 00-070-041	3161
13	UNIV OF IOWA	Curtis, S. A.	GSFC	Anderson, R.	NAG 5-1120	3301
13	UNIV OF IOWA	Wainscott, F.	GSFC	Gurnett, D. A.	NAS 5-26843	3329
13	UNIV OF IOWA	Wainscott, F.	GSFC	Gurnett, D. A.	NAS 5-26857	3330
13	UNIV OF IOWA	O'brien, J. J.	GSFC	Frank, L. A.	NAS 5-27358	3332
13	UNIV OF IOWA	Wainscott, F. H.	GSFC	Frank, L.	NAS 5-30316	3335
13	UNIV OF IOWA	Stich, K.	GSFC	Gurnett, D. A.	NAS 5-30365	3336
13	UNIV OF IOWA	Wainscott, F.	GSFC	Gurnett, D. A.	NAS 5-30371	3337
13	UNIV OF IOWA	Soutullo, B. C.	MSFC	Frank, L. A.	NAS 8-33770	3338
13	UNIV OF IOWA	Desch, M. D.	HQ-ES	Spangler, S. R.	NAGW 806	3307
13	UNIV OF IOWA	Desch, M. D.	HQ-ES	Grabbe, C. L.	NAGW 827	3308
13	UNIV OF IOWA	Mellott, M. M.	HQ-ES	Goertz, C. K.	NAGW 970	3311
13	UNIV OF IOWA	Desch, M. D.	HQ-ES	D'angelo, N.	NAGW 1156	3312
13	UNIV OF IOWA	Desch, M. D.	HQ-ES	Nishikawa, K. I.	NAGW 1239	3315
13	UNIV OF IOWA	Parks, G. K.	HQ-ES	Gurnett, D. A.	NAGW 1488	3316
13	UNIV OF IOWA	Parks, G. K.	HQ-ES	Craven, J. D.	NAGW 1536	3317
13	UNIV OF IOWA	Parks, G. K.	HQ-ES	Kurth, W. S.	NAGW 1539	3318
13	UNIV OF IOWA	Parks, G. K.	HQ-ES	Huang, C. Y.	NAGW 1564	3319
13	UNIV OF IOWA	Mellott, M. M.	HQ-ES	Spangler, S. R.	NAGW 1594	3320
13	UNIV OF IOWA	Parks, G. K.	HQ-ES	Frank, L. A.	NAGW 1631	3321
13	UNIV OF IOWA	Mellott, M. M.	HQ-ES	Goertz, C. K.	NAGW 1632	3322
13	UNIV OF IOWA	Mellott, M. M.	HQ-ES	Smith, R. A.	NAGW 1653	3323
13	UNIV OF IOWA	Parks, G. K.	HQ-ES	Goertz, C.	NAGW 1668	3324
13	UNIV OF IOWA	Mellott, M. M.	HQ-ES	D'angelo, M.	NAGW 1791	3327
13	UNIV OF IOWA	Desch, M. D.	HQ-ES	Van Allen, J. A.	NGL 16-001-002	3340
13	UNIV OF IOWA	Desch, M. D.	HQ-ES	Gurnett, D. A.	NGL 16-001-043	3341
13	UNIV OF IOWA	Owens, F. C.	HQ-XE	D'angelo, N.	NGT 00-050-204	3342
13	UNIV OF KANSAS	Grier, N. T.	LERC	Armstrong, T. P.	NSG 3290	3381
13	UNIV OF KANSAS	Theis, R. F.	HQ-EE	Beard, D. B.	NAGW 1242	3360
13	UNIV OF KANSAS	Mellott, M. M.	HQ-ES	Armstrong, T. P.	NAGW 1357	3363
13	UNIV OF KANSAS	Mellott, M. M.	HQ-ES	Cravens, T. E.	NAGW 1559	3364
13	UNIV OF KANSAS	Clayton, G. C.	HQ-EZ	Melott, A. L.	NAGW 1793	3366
13	UNIV OF MAINE-ORONO	Owens, F. C.	HQ-LE	Comins, N. F.	NGT 00-050-098	3440
13	UNIV MARYLAND-BALT	Gentry, B.	GSFC	Strow, L. L.	NAG 5-509	3503
13	UNIV MARYLAND-BALT	Soffen, G.	GSFC	Strow, L.	NAS 5-33022	3507
13	UNIV MARYLAND-COL PK	Kittel, P.	ARC	Richard, J. P.	NAG 2-270	3516
13	UNIV MARYLAND-COL PK	Hoffman, R. A.	GSFC	Coplan, M. A.	NAG 5-422	3526
13	UNIV MARYLAND-COL PK	Ogilvie, K. W.	GSFC	Coplan, M. A.	NAG 5-579	3528
13	UNIV MARYLAND-COL PK	Curtis, S.	GSFC	Gloeckner, S.	NAG 5-716	3530
13	UNIV MARYLAND-COL PK	Curtis, S. A.	GSFC	Papadopoulos, K.	NAG 5-1101	3556
13	UNIV MARYLAND-COL PK	Ogilvie, K. W.	GSFC	Coplan, M. A.	NAG 5-1129	3559
13	UNIV MARYLAND-COL PK	Hoffman, R. A.	GSFC	Coplan, M. A.	NAG 5-1149	3561
13	UNIV MARYLAND-COL PK	O'brien, J. J.	GSFC	Gloeckler, G.	NAS 5-26856	3592
13	UNIV MARYLAND-COL PK	Carson, D. E.	GSFC	Mason, G. M.	NAS 5-30704	3597
13	UNIV MARYLAND-COL PK	Lauver, R. W.	LERC	Gammon, R. W.	NAG 3-849	3520
13	UNIV MARYLAND-COL PK	Lauver, R. W.	LERC	Gammon, R. W.	NAS 3-25370	3591
13	UNIV MARYLAND-COL PK	Morgan, S. H.	MSFC	Paik, H. J.	NAS 8-36165	3598
13	UNIV MARYLAND-COL PK	Alexander, J. K.	HQ-E	Richard, J. P.	NAGW 1003	3576
13	UNIV MARYLAND-COL PK	Bohlin, J. D.	HQ-ES	Gloeckler, G.	NAGW 101	3569
13	UNIV MARYLAND-COL PK	Mellott, M. M.	HQ-ES	Wu, C. S.	NAGW 971	3575
13	UNIV MARYLAND-COL PK	Bohlin, J. D.	HQ-ES	Finn, J. M.	NAGW 1346	3584
13	UNIV MARYLAND-COL PK	Mellott, M. M.	HQ-ES	Matthews, D. L.	NAGW 1534	3586
13	UNIV MARYLAND-COL PK	Bohlin, J. D.	HQ-ES	Kundu, M. R.	NAGW 1541	3587
13	UNIV MARYLAND-COL PK	Ahluwalia, H. S.	HQ-EZ	Kundu, M. R.	NGR 21-002-199	3616
13	UNIV MARYLAND-COL PK	Owens, F. C.	HQ-XE	Goodman, J.	NGT 00-050-150	3623

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13	UNIV MARYLAND-COL PK	Owens, F. C.	HQ-XE	Ramaty, R.	NGT 00-050-328	3626
13	UNIV MARYLAND-COL PK	Owens, F. C.	HQ-LE	Ramaty, R.	NGT 00-050-055	3620
13	UNIV MARYLAND-COL PK	Owens, F. C.	HQ-LE	Davis, C. C.	NGT 00-050-056	3621
13	UNIV MARYLAND-COL PK	Owens, F. C.	HQ-LE	Ipavich, F. M.	NGT 21-002-820	3631
13	UNIV MARYLAND-COL PK	Owens, F. C.	HQ-LE	Boldt, E.	NGT 21-002-821	3632
13	UNIV OF MASS-AMHERST	Scargie, J.	ARC	Strom, S. E.	NAG 2-344	3900
13	UNIV OF MASS-AMHERST	Owens, F. C.	HQ-LE	Irvine, W. M.	NGT 00-070-009	3927
13	UNIV MICH-ANN ARBOR	Early, L. J.	GSFC	Clarke, J. T.	NAG 5-653	4004
13	UNIV MICH-ANN ARBOR	Early, L. J.	GSFC	Sharp, W. E.	NGR 23-005-360	4073
13	UNIV MICH-ANN ARBOR	Maddrea, G. L.	LARC	Hays, P. B.	NAG 1-817	3978
13	UNIV MICH-ANN ARBOR	Brinton, H. C.	HQ-EL	Nagy, A. F.	NAGW 1409	4037
13	UNIV MICH-ANN ARBOR	Mellott, M. M.	HQ-ES	Hays, P. B.	NAGW 496	4024
13	UNIV MICH-ANN ARBOR	Mellott, M. M.	HQ-ES	Tarle, G.	NAGW 1296	4032
13	UNIV MICH-ANN ARBOR	Mellott, M. M.	HQ-ES	McCormac, F. G.	NAGW 1535	4040
13	UNIV MICH-ANN ARBOR	Mellott, M. M.	HQ-ES	Nagy, A. F.	NAGW 1619	4043
13	UNIV MICH-ANN ARBOR	Mellott, M. M.	HQ-ES	Tarle, G.	NAGW 1642	4044
13	UNIV MICH-ANN ARBOR	Mellott, M. M.	HQ-ES	Abreu, V. J.	NAGW 1783	4048
13	UNIV MICH-ANN ARBOR	Mellott, M. M.	HQ-ES	Samir, U.	NGR 23-005-320	4072
13	UNIV MICH-ANN ARBOR	Owens, F. C.	HQ-XE	Hays, P. B.	NGT 00-050-193	4079
13	UNIV MICH-ANN ARBOR	Owens, F. C.	HQ-XE	Gombosi, T. I.	NGT 00-050-368	4082
13	U MINN-MNPLS-ST PAUL	Early, L. J.	GSFC	Cahill, L. J.	NAG 6-11	4111
13	U MINN-MNPLS-ST PAUL	Early, L. J.	GSFC	Winckler, J. R.	NSG 5088	4140
13	U MINN-MNPLS-ST PAUL	Early, L. J.	GSFC	Kellogg, P. J.	NSG 5373	4141
13	U MINN-MNPLS-ST PAUL	Dudenhoefer, J.	LERC	Simon, T. W.	NAG 3-598	4101
13	U MINN-MNPLS-ST PAUL	Owens, F. C.	HQ-XE	Mauersberger, K.	NGT 00-050-238	4133
13	U MINN-MNPLS-ST PAUL	Owens, F. C.	HQ-XE	Almlof, J.	NGT 00-050-478	4136
13	U MINN-MNPLS-ST PAUL	Owens, F. C.	HQ-LE	Winckler, J. R.	NGT 00-050-009	4130
13	U MINN-MNPLS-ST PAUL	Owens, F. C.	HQ-LE	Pepin, R. O.	NGT 24-001-801	4137
13	UNIV MISS-UNIVERSITY	Willshire, W. L.	LARC	Raspet, R.	NAG 1-1000	4165
13	UNIV MO-ROLLA	Watson, W. R.	LARC	Eversman, W.	NAG 1-814	4178
13	UNIV MO-ROLLA	Fogle, V.	MSFC	Day, D. E.	NAS 8-34758	4183
13	UNIV NEBRASKA-LINCLN	Pouch, J. J.	LERC	Woolam, J. A.	NAG 3-154	4236
13	UNIV NEBRASKA-LINCLN	Warner, J. D.	LERC	Woolam, J. A.	NAG 3-866	4238
13	UNIV NEW HAMP-DURHAM	Early, L. J.	GSFC	Torbert, R. B.	NAG 5-656	4284
13	UNIV NEW HAMP-DURHAM	Scudder, J. D.	GSFC	Torbert, R. B.	NAG 5-1190	4286
13	UNIV NEW HAMP-DURHAM	Ogilvie, K.	GSFC	Torbert, R.	NAS 5-33002	4302
13	UNIV NEW HAMP-DURHAM	Wilson, R. B.	MSFC	Ryan, J. M.	NCC 8-5	4305
13	UNIV NEW HAMP-DURHAM	Butler, D. M.	HQ-EE	Fisk, L. A.	NAGW 76	4288
13	UNIV NEW HAMP-DURHAM	Mellott, M. M.	HQ-ES	Webber, W. R.	NAGW 1530	4295
13	UNIV NEW HAMP-DURHAM	Mellott, M. M.	HQ-ES	Kaufman, R. L.	NAGW 1625	4297
13	UNIV NEW HAMP-DURHAM	Ahluwalia, H. S.	HQ-EZ	Hollweg, J.	NSG 7411	4310
13	UNIV NEW HAMP-DURHAM	Mellott, M. M.	HQ-	Isenberg, P. A.	NAGW 1531	4296
13	UNIV NEW HAMP-DURHAM	Owens, F. C.	HQ-XE	Arnoldy, R. L.	NGT 00-050-299	4308
13	UNIV OF NEW MEXICO	Baker, D. N.	GSFC	Burns, J. O.	NAG 5-1026	4415
13	UNIV OF NEW ORLEANS	Hollenbach, D. J.	ARC	Seab, C. G.	NCA 2-320	3429
13	UNIV N CAR-CHARLOTTE	Vranish, J. M.	GSFC	De Hoff, P. H.	NAG 5-1053	4833
13	UNIV N CAR-CHPL HILL	Owens, F. C.	HQ-XE	Christiansen, W.	NGT 00-050-337	4830
13	UNIV OF PITTSBURGH	Early, L. J.	GSFC	Zipf, E. C.	NAG 5-609	5402
13	UNIV OF PITTSBURGH	Lagerloef, G.	HQ-EE	Choyke, W. J.	NAG 3-603	5397
13	UNIV OF PITTSBURGH	Mellott, M. M.	HQ-ES	Zipf, E. C.	NAGW 1569	5405
13	UNIV OF RHODE ISLAND	Zuckerwar, A. J.	LARC	Cuomo, F. W.	NAG 1-519	5448
13	UNIV OF ROCHESTER	Gillett, F. C.	HQ-EZ	Van Horn, H. M.	NAGW 1476	4747
13	UNIV OF ROCHESTER	Ahluwalia, H. S.	HQ-EZ	Thomas, J. H.	NSG 7562	4749
13	UNIV SAN FRANCISCO	Connolly, J. P.	ARC	Benton, E. V.	NCC 2-521	2342
13	UNIV SAN FRANCISCO	Nachtwey, D. S.	JSC	Benton, E. V.	NAG 9-235	2340
13	UNIV SAN FRANCISCO	Parnell, T. A.	MSFC	Benton, E. V.	NAG 8-71	2337
13	UNIV OF SOUTHERN CAL	Lasher, L. E.	ARC	Judge, D.	NAG 2-146	2355
13	UNIV OF SOUTHERN CAL	Early, L. J.	GSFC	Judge, D. L.	NSG 5108	2375
13	UNIV OF SOUTHERN CAL	Quaide, W. L.	HQ-EL	Dabrowski, A. J.	NASW 4202	2365
13	UNIV OF SOUTHERN CAL	Bohlin, J. D.	HQ-ES	Rhodes, E. J.	NAGW 13	2358

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13	UNIV TEXAS-AUSTIN	McCreight, C. R.	ARC	Bash, F. N.	NAG 2-402	5769
13	UNIV TEXAS-AUSTIN	Kim, J.	ARC	Swinney, H. L.	NCA 2-207	5829
13	UNIV TEXAS-AUSTIN	Christodoulidis, D. C.	GSFC	Tapley, B. D.	NAG 5-746	5779
13	UNIV TEXAS-AUSTIN	Preisser, J. S.	LARC	Blackstock, D. T.	NAS 1-17802	5819
13	UNIV TEXAS-AUSTIN	Rosendhal, J. D.	HQ-E	Tajima, T.	NAGW 846	5811
13	UNIV TEXAS-AUSTIN	Bohlin, J. D.	HQ-ES	Steinolfson, R. S.	NAGW 1324	5814
13	UNIV TEXAS-AUSTIN	Owens, F. C.	HQ-XE	Shapiro, P. R.	NGT 00-050-519	5849
13	UNIV TEXAS-AUSTIN	Wander, S. M.	HQ-RF	Dolling, D. S.	NAGW 964	5812
13	UNIV TEXAS-DALLAS	Adkins, R. E.	GSFC	Hanson, W. B.	NAS 5-25310	5873
13	UNIV TEXAS-DALLAS	Siemers, P. M.	LARC	Hoffman, J. H.	NAG 1-989	5859
13	UNIV TEXAS-DALLAS	Gustafson, J. C.	LARC	Hoffman, J. H.	NCC 1-119	5878
13	UNIV TEXAS-DALLAS	Waite, J. H.	MSFC	Hoffman, J. H.	NAG 8-80	5862
13	UNIV TEXAS-DALLAS	Chappell, C. R.	MSFC	Hoffman, J. H.	NAG 8-688	5863
13	UNIV TEXAS-DALLAS	Moore, T. E.	MSFC	Hoffman, J. H.	NAS 8-37582	5877
13	UNIV TEXAS-DALLAS	Mellott, M. M.	HQ-ES	Heikkila, W. J.	NAGW 935	5865
13	UNIV TEXAS-DALLAS	Mellott, M. M.	HQ-ES	Heikkila, W. J.	NAGW 957	5866
13	UNIV TEXAS-DALLAS	Mellott, M. M.	HQ-ES	Breig, E. L.	NAGW 1571	5869
13	U TEX SW MED CTR-DA	Owens, F. C.	HQ-LE	Templeton, G. H.	NGT 44-080-800	5907
13	UNIV TEXAS-S ANTONIO	Theis, R. F.	HQ-EE	Saflekos, N. A.	NAGW 1254	5918
13	UNIV TEXAS-S ANTONIO	Mellott, M. M.	HQ-ES	Saflekos, N. A.	NAGW 1663	5919
13	UNIV OF UTAH	Kourtides, D. A.	ARC	Bascom, W.	NAG 2-444	5929
13	UNIV OF UTAH	Mellott, M. M.	HQ-ES	Sojka, J. J.	NAGW 1547	5935
13	UNIV OF VIRGINIA	Zang, T. A.	LARC	Ortega, J. M.	NAG 1-1050	6109
13	UNIV OF VIRGINIA	Mellott, M. M.	HQ-ES	Dorning, J. J.	NAGW 1669	6131
13	UNIV OF VIRGINIA	Clayton, G. C.	HQ-EZ	Chevalier, R. A.	NAGW 764	6126
13	UNIV OF VIRGINIA	Owens, F. C.	HQ-XE	Dorning, J. J.	NGT 00-050-183	6145
13	UNIV OF WASHINGTON	Early, L. J.	GSFC	Holzworth, R. H.	NAG 5-604	6264
13	UNIV OF WASHINGTON	Early, L. J.	GSFC	Holzworth, R. H.	NAG 5-635	6265
13	UNIV OF WASHINGTON	O'brien, J. J.	GSFC	Parks, G. K.	NAS 5-26850	6320
13	UNIV OF WASHINGTON	Stich, K.	GSFC	Parks, G. K.	NAS 5-30613	6321
13	UNIV OF WASHINGTON	Deyoung, R. J.	LARC	Christiansen, W. H.	NAG 1-176	6251
13	UNIV OF WASHINGTON	Asrar, G.	HQ-EE	Tsang, L.	NAGW 1702	6314
13	UNIV OF WASHINGTON	Mellott, M. M.	HQ-ES	Holzworth, R. H.	NAGW 1218	6302
13	UNIV OF WASHINGTON	Mellott, M. M.	HQ-ES	Lord, J. J.	NAGW 1517	6311
13	UNIV OF WASHINGTON	Mellott, M. M.	HQ-ES	Holzworth, R. H.	NAGW 1723	6315
13	UNIV OF WASHINGTON	Ahluwalia, H. S.	HQ-ES	Massey, R. D.	NGT 00-050-283	6331
13	UNIV OF WASHINGTON	Owens, F. C.	HQ-XE	Hobbs, P. V.	NGT 00-050-443	6334
13	UNIV OF WASHINGTON	Owens, F. C.	HQ-LE	Parks, G. K.	NGT 00-050-023	6329
13	UNIV WISC-MADISON	Glasser, C. A.	GSFC	McCammon, D.	NAG 5-594	6389
13	UNIV WISC-MADISON	Early, L. J.	GSFC	McCammon, D.	NAG 5-629	6390
13	UNIV WISC-MADISON	Early, L. J.	GSFC	Nordsieck, K. H.	NAG 5-647	6391
13	UNIV WISC-MADISON	Dipirro, M. J.	GSFC	Van Sciver, S. W.	NAG 5-1031	6396
13	UNIV WISC-MADISON	Leckrone, D. S.	GSFC	Lawler, J. E.	NAG 5-1048	6397
13	UNIV WISC-MADISON	Aggson, T. L.	GSFC	Hershkowitz, N.	NAG 5-1135	6401
13	UNIV WISC-MADISON	Mellott, M. M.	HQ-ES	Hershkowitz, N.	NAGW 905	6414
13	UNIV WISC-MADISON	Mellott, M. M.	HQ-ES	Hershkowitz, N.	NAGW 1778	6426
13	UNIV WISC-MADISON	Owens, F. C.	HQ-XE	Savage, B. D.	NGT 00-050-426	6451
13	UTAH STATE UNIV	Early, L. J.	GSFC	Baker, K. D.	NAG 5-603	5941
13	UTAH STATE UNIV	Early, L. J.	GSFC	Raitt, W. J.	NAG 5-607	5942
13	UTAH STATE UNIV	Early, L. J.	GSFC	Raitt, W. J.	NAG 5-658	5943
13	UTAH STATE UNIV	Mellott, M. M.	HQ-ES	Labelle, J. W.	NAGW 1540	5946
13	VANDERBILT UNIVERSTY	Carruth, M. R.	MSFC	Albridge, R. G.	NAS 8-37744	5538
13	VANDERBILT UNIVERSTY	Reynolds, J.	MSFC	Aldbridge, R. G.	NAS 8-37748	5539
13	VANDERBILT UNIVERSTY	Owens, F. C.	HQ-LE	Haglund, R. F.	NGT 00-050-126	5541
13	VANDERBILT UNIVERSTY	Owens, F. C.	HQ-LE	Tolk, N. H.	NGT 00-050-132	5542
13	COLLEGE OF WM & MARY	Madaras, E. I.	LARC	Smith, B. T.	NAG 1-1063	5981
13	COLLEGE OF WM & MARY	Smith, M. A.	LARC	Benner, D. C.	NCC 1-80	5986
13	VIRGINIA POLY INST	Brockman, P.	LARC	Claus, R. O.	NAG 1-831	6183
13	VIRGINIA STATE UNIV	Brockman, P.	LARC	Henderson, G. W.	NAG 1-743	6246
13	WASHINGTON ST UNIV	Knott, W.	KSC	Poovaliah, B. W.	NAG10-61	6347

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13	WASHINGTON ST UNIV	Townsend, L. W.	LARC	Norbury, J. W.	NAG 1-797	6342
13	WASHINGTON UNIVERSITY	Madaras, E. T.	LARC	Miller, J. G.	NSG 1601	4224
13	WASHINGTON UNIVERSITY	Richman, J. G.	HQ-EE	Walker, R. M.	NGT 00-050-024	4215
13	WASHINGTON UNIVERSITY	Owens, F. C.	HQ-XE	Klarmann, J.	NGT 00-050-182	4219
13	WASHINGTON UNIVERSITY	Owens, F. C.	HQ-XE	Hohenberg, C. M.	NGT 00-050-194	4220
13	WASHINGTON UNIVERSITY	Owens, F. C.	HQ-LB	Miller, J. G.	NGT 26-010-800	4223
13	WITTENBERG UNIV	Schwarze, G. E.	LERC	Frasca, A. J.	NAG 3-793	5172
13	YALE UNIVERSITY	Moseley, S. H.	GSFC	Prober, D. E.	NAG 5-1244	2601
13	YALE UNIVERSITY	Owens, F. C.	HQ-XE	Ma, T.	NGT 00-050-284	2610
19	ALABAMA A&M UNIV	Foster, C.	MSFC	McGuire, S. Y.	NAS 8-36277	1018
19	ARIZONA STATE UNIV	Boyce, J. M.	HQ-EL	Holloway, J. R.	NAGW 1456	1265
19	ATLANTA UNIVERSITY	Charleston, J. A.	LERC	Reed, J. L.	NAG 3-113	2833
19	AUBURN UNIV-AUBURN	Gulino, D. A.	LERC	Tatarchuk, B. J.	NCC 3-83	1045
19	AUBURN UNIV-AUBURN	Nunes, A.	MSFC	Jemian, W. A.	NAS 8-37232	1042
19	BAYLOR UNIVERSITY	Mahaffy, P. R.	HQ-EL	Alexander, W. M.	NAGW 1282	5548
19	BOSTON UNIVERSITY	Asrar, G.	HQ-EE	Strahler, A.	NAGW 1474	3650
19	BROOKLYN COLLEGE	Clark, I. O.	LARC	Pollak, F. H.	NAG 1-1028	4428
19	BROWN UNIVERSITY	Underwood, J. R.	HQ-EL	Rutherford, M. J.	NAGW 1393	5435
19	CALIF INST OF TECH	Bahrami, P. A.	ARC	Coles, D.	NCC 2-600	1564
19	CALIF INST OF TECH	Bullock, G. D.	GSFC	Huford, G.	NAG 5-946	1506
19	CALIF INST OF TECH	Bullock, G. D.	GSFC	Zivin, H.	NAG 5-1095	1509
19	CALIF INST OF TECH	Browne, I. D.	JSC	Stolper, E.	NAG 9-105	1526
19	CALIF INST OF TECH	Quaide, W. L.	HQ-EL	Stevenson, D. J.	NAGW 1213	1536
19	CALIF INST OF TECH	Quaide, W. L.	HQ-EL	Ingersoll, A. P.	NAGW 1219	1537
19	CALIF INST OF TECH	Underwood, J. R.	HQ-EL	Stolper, E. M.	NAGW 1427	1543
19	CALIF INST OF TECH	Vescelus, F.	HQ-EL	Muhleman, D. O.	NASW 3983	1559
19	CAL STATE U-NRTHRIDGE	Bullock, G. D.	GSFC	Chapman, G. A.	NAG 5-1219	1612
19	CASE WESTERN RESERVE	Stearns, C. A.	LERC	Vedula, K.	NCC 3-43	4903
19	CASE WESTERN RESERVE	Stearns, C. A.	LERC	Pirouz, P.	NCC 3-73	4905
19	CASE WESTERN RESERVE	Decker, A. J.	LERC	Haacke, E. M.	NCC 3-103	4914
19	CASE WESTERN RESERVE	Owens, F. C.	HQ-XE	Ostrach, S.	NGT 00-050-448	4938
19	CASE WESTERN RESERVE	Owens, F. C.	HQ-XE	T'ien, J. S.	NGT 00-050-504	4939
19	CHRISTPHR NEWPRT COL	Wilson, J. W.	LARC	Chang, C. K.	NAG 1-1036	5967
19	CHRISTPHR NEWPRT COL	Wilson, J. W.	LARC	Chang, C. K.	NSG 1614	5969
19	COLUMBIA UNIVERSITY	Rubessin, M. W.	ARC	Prendergast, K.	NCA 2-294	4495
19	COLUMBIA UNIVERSITY	Browne, I. D.	JSC	Longhi, J.	NAG 9-329	4481
19	CORNELL UNIVERSITY	Pfaff, R. F.	GSFC	Swartz, W. E.	NAG 5-1116	4528
19	CORNELL UNIVERSITY	Early, L. J.	GSFC	Kelley, M. C.	NSG 6020	4590
19	CORNELL UNIVERSITY	Quaide, W. L.	HQ-EL	Gierasch, P. J.	NAGW 1186	4546
19	CORNELL UNIVERSITY	Quaide, W.	HQ-EL	Squyres, S. W.	NAGW 1199	4548
19	CORNELL UNIVERSITY	Quaide, W. L.	HQ-EL	Nicholson, P. D.	NAGW 1200	4549
19	CORNELL UNIVERSITY	Quaide, W. L.	HQ-EL	Thomas, P.	NAGW 1201	4550
19	CORNELL UNIVERSITY	Quaide, W. L.	HQ-EL	Sagan, C.	NAGW 1495	4558
19	CORNELL UNIVERSITY	Owens, F. C.	HQ-XE	Bird, J. M.	NGT 00-050-211	4577
19	CORNELL UNIVERSITY	Owens, F. C.	HQ-XE	Veverka, J.	NGT 00-050-482	4585
19	DEPAUL UNIVERSITY	Goldstein, S. H.	JSC	Nerheim, R.	NAG 9-313	2986
19	DRAKE UNIVERSITY	Fowles, W. W.	MSFC	Kopicky, K. J.	NAS 8-33728	3260
19	DREXEL UNIVERSITY	Clark, I. O.	LARC	Bose, S. M.	NAG 1-708	5246
19	DUKE UNIVERSITY	Owens, F. C.	HQ-LE	De Lucia, F. C.	NGT 00-050-046	4762
19	FLORIDA STATE UNIV	Oseroff, H.	GSFC	Smith, E. A.	NAG 5-849	2736
19	FLORIDA STATE UNIV	Owens, F. C.	HQ-XE	Carney, T. A.	NGT 00-050-437	2751
19	FLORIDA STATE UNIV	Owens, F. C.	HQ-XE	Nicholson, S. E.	NGT 00-050-475	2752
19	FLORIDA STATE UNIV	Owens, F. C.	HQ-XE	O'brien, J. J.	NGT 00-050-484	2753
19	GEORGE WASHINGTON U	Stephens, J. B.	MSFC	Logsdon, J. M.	NAG 8-788	2668
19	GRAND VALLEY ST UNI	Trevino, R. C.	JSC	Lewis, W. C.	NAG 9-338	3957
19	HAMPTON UNIVERSITY	Herman, C.	JSC	Adeyiga, A. A.	NAG 9-333	6016
19	INDIANA U-BLOOMINGTN	Trombka, J. L.	GSFC	Friesel, D.	NAG 5-721	3177
19	IOWA STATE UNIV	Smith, B. F.	ARC	Iverson, J. D.	NAG 2-151	3264
19	IOWA STATE UNIV	Pollack, J. B.	ARC	Richardson, S. M.	NCC 2-174	3284
19	JOHNS HOPKINS UNIV	Wainscott, F.	GSFC	Feldman, P. D.	NAS 5-26848	3478

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19	LA ST U&A&M COL-BRGE	Stetina, F. L.	GSFC	Hill, M.	NAS 5-30123	3408
19	MASS INST OF TECH	Snyder, D. B.	LERC	Hastings, D. E.	NAG 3-695	3738
19	MASS INST OF TECH	Schmerling, E. R.	HQ-E	Young, L. R.	NAGW 1092	3807
19	MASS INST OF TECH	White, R. J.	HQ-EB	Oman, C. M.	NAGW 1377	3814
19	MASS INST OF TECH	Quaide, W. L.	HQ-EL	McNutt, R. L.	NAGW 1209	3810
19	MASS INST OF TECH	Crouch, R. K.	HQ-EL	Gatos, H. C.	NSG 7331	3883
19	MASS INST OF TECH	Crouch, R. K.	HQ-EN	Lagowski, J.	NAGW 1563	3822
19	MASS INST OF TECH	Crouch, R. K.	HQ-EN	Szekely, J.	NAGW 1762	3828
19	MASS INST OF TECH	Owens, F. C.	HQ-XE	Wurtman, R. J.	NGT 00-070-027	3875
19	MICHIGAN STATE UNIV	Owens, F. C.	HQ-XE	Poff, K. L.	NGT 00-050-241	3967
19	MIDDLEBURY COLLEGE	Bullock, G. D.	GSFC	Wolfson, R.	NAG 5-762	5958
19	MONTANA STATE UNIV	Goldstein, S. H.	JSC	Geer, R. D.	NAG 9-316	4231
19	NEW MEX INST MINING	Borucki, W. J.	ARC	Winn, W. P.	NCA 2-408	4380
19	NEW MEX ST U-LAS CR	Quaide, W. L.	HQ-EL	Beebe, R.	NAGW 1172	4389
19	NEW MEX ST U-LAS CR	Fox, K.	HQ-EL	Beebe, R.	NAGW 1449	4391
19	NEW YORK UNIVERSITY	Christian, J. L.	LERC	Miller, G.	NAG 3-1048	4602
19	NO CAR A&T STATE U	Herman, C.	JSC	Foster, J.	NAG 9-334	4780
19	NO CAROLINA STATE U	Wander, S. M.	HQ-RF	Dejarnette, R.	NAGW 1072	4802
19	NORTHEASTERN UNIV	Goldstein, S. H.	JSC	Wiley, R. J.	NAG 9-314	3893
19	NORTHWESTERN UNIV	Bullock, G. D.	GSFC	Ulmer, M. P.	NAG 5-933	3000
19	OHIO STATE UNIV	Bullock, G. D.	GSFC	Mitchell, W. E., Jr.	NAG 5-768	5037
19	OHIO STATE UNIV	Wander, S. M.	HQ-RF	Petrie, S. L.	NAGW 1060	5047
19	OLD DOMINION UNIV	Pittman, J. L.	LARC	Baysal, O.	NAG 1-811	6046
19	PENN STATE U-UNIV PK	Oseroff, H.	GSFC	Carlson, T. N.	NAG 5-919	5314
19	PENN STATE U-UNIV PK	Bullock, G. D.	GSFC	Garmire, G. P.	NAG 5-941	5315
19	PENN STATE U-UNIV PK	Early, L. J.	GSFC	Mitchell, J. D.	NAG 6-7	5321
19	PENN STATE U-UNIV PK	Early, L. J.	GSFC	Hale, L. C.	NSG 6004	5374
19	PENN STATE U-UNIV PK	Alexander, M. B.	MSFC	Bohren, C. F.	NAS 8-36194	5343
19	PENN STATE U-UNIV PK	Owens, F. C.	HQ-XE	Carlson, T.	NGT 00-050-509	5368
19	PITZER COL	Bullock, G. D.	GSFC	Higdon, J. C.	NAG 5-1011	1626
19	PRAIRIE VIEW A&M U	Herman, C.	JSC	Wang, F. C.	NAG 9-332	5570
19	PRAIRIE VIEW A&M U	Herman, C.	JSC	Kumar, A. A.	NAG 9-337	5571
19	PRINCETON UNIVERSITY	Owens, F. C.	HQ-XE	Sarmiento, J.	NGT 00-050-243	4359
19	RICE UNIVERSITY	Bullock, G. D.	GSFC	Reiff, P.	NAG 5-775	5580
19	ST U NY COL-PLATTSBG	Goldstein, S. H.	JSC	Flynn, G. J.	NAG 9-257	4733
19	SAN JOSE STATE UNIV	Brocker, D. H.	ARC	Ragent, B.	NCC 2-466	1674
19	SAN JOSE STATE UNIV	Dyer, J. W.	ARC	Colin, L.	NCC 2-527	1676
19	SAN JOSE STATE UNIV	Trombka, J. I.	GSFC	Englert, P. A.	NAG 5-1273	1647
19	SANTA CLARA UNIV	Whitten, R. C.	ARC	McCormick, P. T.	NCC 2-130	2350
19	STANFORD UNIVERSITY	Bullock, G. D.	GSFC	Helliwell, R. A.	NAG 5-476	1711
19	STANFORD UNIVERSITY	Bullock, G. D.	GSFC	Carpenter, D. L.	NAG 5-884	1713
19	STANFORD UNIVERSITY	Bullock, G. D.	GSFC	Schevyer, P. H.	NAG 5-944	1715
19	STANFORD UNIVERSITY	Pusey, M.	MSFC	Feigelson, R. S.	NAG 8-774	1722
19	STANFORD UNIVERSITY	Giles, B. L.	MSFC	Carpenter, D. L.	NAG 8-784	1724
19	TENNESSEE STATE UNIV	Randall, J. L.	MSFC	Chaudhuyi, D. K.	NAG 8-87	5498
19	TEXAS A&M UNIVERSITY	Needleman, H. C.	GSFC	Noel, J.	NAG 5-655	5645
19	TEXAS A&M UNIVERSITY	Oran, W.	HQ	Patton, A.	NAGW 1194	5671
19	TEXAS SOUTHERN UNIV	Goldstein, S. H.	JSC	Murty, V. S.	NAG 9-258	5703
19	TRI STATE UNIV	Harrison, J. K.	MSFC	Swenson, F. R.	NAG 8-620	3248
19	U CAL-SYS AT BERKLEY	Margolis, M.	HQ-U	Snow, L. N.	NGT 00-090-014	2330
19	UNIV ALA-HUNTSVILLE	Early, L. J.	GSFC	Torbert, R. B.	NAG 5-634	1090
19	UNIV ALA-HUNTSVILLE	Poorman, R. M.	MSFC	Smith, J. E.	NAG 8-708	1129
19	UNIV ALA-HUNTSVILLE	Witherow, W. K.	MSFC	Fredericks, W. J.	NAG 8-733	1134
19	UNIV ALA-HUNTSVILLE	Robinson, M. B.	MSFC	Workman, G. L.	NAS 8-36620	1162
19	UNIV ALA-HUNTSVILLE	Fields, S.	MSFC	Torr, D.	NAS 8-37576	1171
19	UNIV ALA-HUNTSVILLE	Ruff, R. C.	MSFC	Gilbert, J. A.	NCC 8-15	1182
19	UNIV ALASKA-FAIRBNKS	Hall, D. K.	GSFC	Benson, C. S.	NAG 5-887	1201
19	UNIV ALASKA-FAIRBNKS	Early, L. J.	GSFC	Wescott, E. M.	NAG 6-1	1204
19	UNIV ALASKA-FAIRBNKS	Oseroff, H.	GSFC	McRoy, C.	NAS 5-28769	1218
19	UNIV ALASKA-FAIRBNKS	Vinas, A. F.	HQ-EE	Akasofu, S. I.	NSG 7447	1224

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19	UNIV ALASKA-FAIRBNKS	Mellott, M. M.	HQ-ES	Swift, D. W.	NAGW 269	1205
19	UNIV OF ALBUQUERQUE	Bohlin, J. D.	HQ-ES	Ahluwalia, H. S.	NAGW 1468	4410
19	UNIV OF ARIZONA	Lasher, L. E.	ARC	Hunten, D. M.	NAG 2-143	1288
19	UNIV OF ARIZONA	Osecoff, H.	GSFC	Slater, P. N.	NAG 5-859	1318
19	UNIV OF ARIZONA	Oseroff, H.	GSFC	Hutchinson, C. F.	NAG 5-861	1319
19	UNIV OF ARIZONA	Schmerling, E. R.	HQ-E	Schooley, L. C.	NAGW 1073	1373
19	UNIV OF ARIZONA	Alexander, J. K.	HQ-E	Sandel, B. R.	NAGW 1676	1409
19	UNIV OF ARIZONA	Quaide, W. L.	HQ-EL	Yelle, R. V.	NAGW 1181	1378
19	UNIV OF ARIZONA	Quaide, W. L.	HQ-EL	Shemansky, D. E.	NAGW 1182	1379
19	UNIV OF ARIZONA	Quaide, W. L.	HQ-EL	Hood, L. L.	NAGW 1203	1381
19	UNIV OF ARIZONA	Quaide, W. L.	HQ-EL	Yelle, R. V.	NAGW 1207	1382
19	UNIV OF ARIZONA	Quaide, W. L.	HQ-EL	Sandel, B. R.	NAGW 1208	1383
19	UNIV OF ARIZONA	Quaide, W. L.	HQ-EL	Strom, R. G.	NAGW 1212	1384
19	UNIV OF ARIZONA	Quaide, W. L.	HQ-EL	Sandel, B. R.	NAGW 1214	1385
19	UNIV OF ARIZONA	Boyce, J. M.	HQ-EL	Gehrels, T.	NAGW 1463	1401
19	UNIV OF ARIZONA	Mellott, M. M.	HQ-ES	Hood, L. L.	NAGW 1658	1408
19	UNIV OF ARIZONA	Schwartz, E.	HQ-XE	Teschlea, M. E.	NGT 00-050-274	1455
19	UNIV OF ARIZONA	Owens, F. C.	HQ-XE	Hubbard, W. B.	NGT 00-050-477	1463
19	UNIV OF ARIZONA	Owens, F. C.	HQ-XE	Lunine, J. I.	NGT 00-050-479	1464
19	UNIV CALIF-BERKELEY	Kittel, P.	ARC	Lange, A.	NCA 2-240	1945
19	UNIV CALIF-BERKELEY	Smith, B. F.	ARC	Klein, R.	NCA 2-281	1952
19	UNIV CALIF-BERKELEY	Clark, T. A.	GSFC	Welch, W. J.	NAG 5-95	1875
19	UNIV CALIF-BERKELEY	Bullock, G. D.	GSFC	Hurley, K. C.	NAG 5-935	1882
19	UNIV CALIF-BERKELEY	Early, L. J.	GSFC	Carlson, C. W.	NAG 6-10	1890
19	UNIV CALIF-BERKELEY	Alexander, J. K.	HQ-E	Saykally, R. J.	NAGW 1022	1905
19	UNIV CALIF-BERKELEY	Evans, L. G.	HQ-EL	Lin, R. P.	NAGW 1240	1906
19	UNIV CALIF-BERKELEY	Mellott, M. M.	HQ-ES	Anderson, K. A.	NGL 05-003-017	1968
19	UNIV CALIF-BERKELEY	Owens, F. C.	HQ-XE	Feldman, L. J.	NGT 00-050-293	1986
19	UNIV CALIF-L ANGELES	Bullock, G. D.	GSFC	Maggs, J. E.	NAG 5-488	2074
19	UNIV CALIF-L ANGELES	Wales, R. O.	GSFC	Russell, C. T.	NAG 5-1067	2082
19	UNIV CALIF-L ANGELES	Weinscott, F. H.	GSFC	Russell, C. T.	NAS 5-26846	2125
19	UNIV CALIF-L ANGELES	Browne, I. D.	JSC	Warren, P. H.	NAG 9-87	2092
19	UNIV CALIF-L ANGELES	Quaide, W. L.	HQ-EL	Walker, R. J.	NAGW 1179	2109
19	UNIV CALIF-L ANGELES	Quaide, W. L.	HQ-EL	Siscoe, G. L.	NAGW 1189	2110
19	UNIV CALIF-L ANGELES	Quaide, W. L.	HQ-EL	Russell, C. T.	NAGW 1190	2111
19	UNIV CALIF-L ANGELES	Quaide, W. L.	HQ-EL	Barbosa, D. D.	NAGW 1220	2112
19	UNIV CALIF-L ANGELES	Owens, F. C.	HQ-XE	Grindeland, R.	NGT 00-070-025	2153
19	UNIV CALIF-SAN DIEGO	Lasher, L. E.	ARC	Fillius, W.	NAG 2-153	2171
19	UNIV CALIF-SAN DIEGO	Bullock, G. D.	GSFC	Lingenfelter, R. E.	NAG 5-945	2183
19	UNIV CALIF-SAN DIEGO	Scudder, J. D.	GSFC	Filius, W. F.	NAG 5-1028	2186
19	UNIV CALIF-SAN DIEGO	Bullock, G. D.	GSFC	Hudson, H.	NAG 5-1071	2187
19	UNIV CALIF-SAN DIEGO	Mellott, M. M.	HQ-ES	Alfven, H.	NSG 7623	2266
19	UNIV CALIF-S BARBARA	Underwood, J. R.	HQ-EL	Spera, F.	NAGW 1452	2299
19	UNIV CALIF-S BARBARA	Owens, F. C.	HQ-XE	Simonett, D. S.	NGT 00-050-461	2306
19	UNIV CALIF-S CRUZ	Quaide, W. L.	HQ-EL	Lin, D. N.	NAGW 1211	2311
19	UNIV OF CHICAGO	Wales, R. O.	GSFC	Meyer, P.	NAS 5-28500	3062
19	UNIV OF CHICAGO	Quaide, W. L.	HQ-EL	Simpson, J. A.	NASW 3959	3064
19	UNIV OF CHICAGO	Owens, F. C.	HQ-XE	Ziegler, A. M.	NGT 00-050-184	3078
19	UNIV OF CHICAGO	Owens, F. C.	HQ-XE	Srivastava, R. C.	NGT 00-050-449	3085
19	UNIV OF CHICAGO	Owens, F. C.	HQ-LE	MacAyeal, D. R.	NGT 00-050-059	3076
19	UNIV OF CINCINNATI	Pouch, J.	LERC	Kapoor, V. J.	NCC 3-33	5127
19	UNIV OF CINCINNATI	Mirtich, M. J.	LERC	Kapoor, V. J.	NCC 3-36	5128
19	UNIV COLORADO-BOLDR	Early, L. J.	GSFC	Barth, C. A.	NSG 5103	2563
19	UNIV COLORADO-BOLDR	Quaide, W. L.	HQ-EL	Esposito, L. W.	NAGW 1491	2504
19	UNIV COLORADO-BOLDR	Naumann, R. J.	HQ-EN	Kassoy, D. R.	NAGW 951	2477
19	UNIV COLORADO-BOLDR	Owens, F. C.	HQ-XE	Born, G.	NGT 00-050-491	2558
19	UNIV OF DELAWARE	Oseroff, H.	GSFC	Willmott, C. J.	NAG 5-853	2615
19	UNIV OF DELAWARE	Curtis, H. B.	LERC	Barnett, A. M.	NAG 3-422	2614
19	UNIV OF DELAWARE	Quaide, W.	HQ-EL	Smith, C.	NAGW 1514	2625
19	UNIV OF FLORIDA	Trombka, J. I.	GSFC	Rester, A. C.	NAG 5-1290	2780

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19	UNIV OF FLORIDA	Quiade, W.	HQ-EL	Campins, H.	NAGW 1821	2785
19	UNIV OF FLORIDA	Quaide, L.	HQ-EL	Dermott, S. F.	NAGW 1832	2786
19	UNIV OF HAWAII-MANOA	Bullock, G. D.	GSFC	Cantfield, R. C.	NAG 5-744	2926
19	UNIV OF HAWAII-MANOA	Bullock, G. D.	GSFC	Comfield, R. G.	NAG 5-1072	2930
19	UNIV OF HAWAII-MANOA	Quaide, W. L.	HQ-EL	Wilson, L.	NAGW 1216	2953
19	UNIV OF HAWAII-MANOA	Quaide, W. L.	HQ-EL	McCord, T. M.	NAGW 1492	2960
19	UNIV HOUSTON-CL LAKE	Atkinson, J. D.	JSC	Miller, W. C.	NAG 9-317	5755
19	UNIV ILLINOIS-URBANA	Early, L. J.	GSFC	Bowhill, S. A.	NGR 14-005-181	3153
19	UNIV ILLINOIS-URBANA	Purvis, C. K.	LERC	Kushner, M. J.	NAG 3-741	3120
19	UNIV OF IOWA	Bullock, G. D.	GSFC	Gurnett, D. A.	NAG 5-310	3297
19	UNIV OF IOWA	Bullock, G. D.	GSFC	Frank, L. A.	NAG 5-483	3298
19	UNIV OF IOWA	Wales, R. O.	GSFC	Frank, L. A.	NAG 5-1109	3300
19	UNIV OF IOWA	Purvis, C. K.	LERC	Kurth, W. S.	NAG 3-449	3293
19	UNIV OF IOWA	Rosendhal, J. D.	HQ-E	Spangler, S. R.	NAGW 831	3309
19	UNIV OF IOWA	Alexander, J. K.	HQ-E	Fix, J. D.	NAGW 871	3310
19	UNIV OF IOWA	Quaide, W. L.	HQ-EL	Neff, J. S.	NAGW 1188	3313
19	UNIV OF IOWA	Quaide, W. L.	HQ-EL	Calvert, W.	NAGW 1206	3314
19	UNIV OF IOWA	Desch, M. D.	HQ-ES	Goertz, C. K.	NSG 7632	3345
19	UNIV MARYLAND-COL PK	Bullock, G. D.	GSFC	Wu, C. S.	NAG 5-454	3527
19	UNIV MARYLAND-COL PK	Tanner, R.	GSFC	Adler, I.	NAG 5-924	3544
19	UNIV MARYLAND-COL PK	Bullock, A. D.	GSFC	Goodrich, C. C.	NAG 5-950	3546
19	UNIV MARYLAND-COL PK	Bullock, A. D.	GSFC	Kundu, M. R.	NAG 5-969	3549
19	UNIV MARYLAND-COL PK	Hoegy, W. R.	GSFC	Greenwood, S. W.	NCC 5-35	3611
19	UNIV MARYLAND-COL PK	Jones, F.	GSFC	Gloeckler, G.	NGR 21-002-316	3618
19	UNIV MARYLAND-COL PK	Tilford, S. G.	HQ-EE	Ginter, M. L.	NAGW 1326	3583
19	UNIV MARYLAND-COL PK	Mellott, M. M.	HQ-ES	Wu, C. S.	NGL 21-002-005	3613
19	UNIV OF MASS-AMHERST	Owens, F. C.	HQ-XE	Swift, C. T.	NGT 00-050-487	3926
19	UNIV MICH-ANN ARBOR	Bullock, G. D.	GSFC	Hays, P. B.	NAG 5-465	3999
19	UNIV MICH-ANN ARBOR	Bullock, G. D.	GSFC	Nagy, A. F.	NAG 5-472	4000
19	UNIV MICH-ANN ARBOR	Bullock, G. D.	GSFC	Carignan, G. R.	NAG 5-482	4002
19	UNIV MICH-ANN ARBOR	Brace, L. H.	GSFC	Fontheim, E. G.	NAG 5-844	4006
19	UNIV MICH-ANN ARBOR	Oseroff, H.	GSFC	Dobson, C.	NAG 5-852	4007
19	UNIV MICH-ANN ARBOR	Trombka, J. I.	GSFC	Sharp, W. E.	NAG 5-1158	4012
19	UNIV MICH-ANN ARBOR	Chai, A. T.	LERC	Yang, W. J.	NAG 3-903	3995
19	UNIV MICH-ANN ARBOR	Quaide, W. L.	HQ-EL	Bishop, J. E.	NAGW 1504	4039
19	U MINN-MNPLS-ST PAUL	Bullock, G. D.	GSFC	Cahill, L. J.	NAG 5-529	4105
19	U MINN-MNPLS-ST PAUL	Scudder, J. D.	GSFC	Kellogg, P. J.	NAG 5-983	4107
19	U MINN-MNPLS-ST PAUL	Owens, F. C.	HQ-XE	Banerjee, S.	NGT 00-050-421	4135
19	UNIV MISS-UNIVERSITY	Blakeslee, R.	MSFC	Marshall, T. C.	NAG 8-648	4166
19	UNIV NEW HAMP-DURHAM	Gordon, F.	GSFC	Chupp, E. L.	NAG 5-720	4285
19	UNIV NEW HAMP-DURHAM	Early, L. J.	GSFC	Arnoldy, R. L.	NAG 6-12	4287
19	UNIV OF NEW MEXICO	Oseroff, H.	GSFC	Morain, S. A.	NAG 5-851	4414
19	UNIV OF NEW ORLEANS	Wood, G. M.	LARC	loup, G. E.	NAG 1-804	3428
19	UNIV OKLAHOMA-NORMAN	Oseroff, H.	GSFC	Duchon, C. E.	NAG 5-850	5185
19	UNIV OKLAHOMA-NORMAN	Madaras, E. I.	LARC	Kline, R. A.	NAG 1-1054	5184
19	UNIV OF PENNSYLVANIA	Owens, F. C.	HQ-LE	Shen, B.	NGT 39-090-800	5395
19	UNIV OF PITTSBURGH	Early, L. J.	GSFC	Zipf, E. C.	NAG 6-2	5403
19	UNIV OF ROCHESTER	Bullock, G. D.	GSFC	Thomas, J. H.	NAG 5-934	4746
19	UNIV SAN FRANCISCO	Parnell, T. A.	MSFC	Benton, E. V.	NAG 8-789	2339
19	UNIV OF SOUTHERN CAL	Wander, S. M.	HQ-RF	Kaplan, R. E.	NAGW 1061	2361
19	UNIV SO MISSISSIPPI	Wood, G. M.	LARC	Rayborn, G. H.	NAG 1-800	4168
19	UNIV TENNESSEE-KNOXV	Browne, I. D.	JSC	Taylor, L. A.	NAG 9-336	5516
19	UNIV TENNESSEE-KNOXV	Esbridge, R.	MSFC	Jeng, S.	NAS 8-36220	5522
19	UNIV TEXAS-ARLINGTON	Asrar, G.	HQ-EE	Fung, A. K.	NAGW 1800	5758
19	UNIV TEXAS-AUSTIN	Bullock, G. D.	GSFC	Steinolfson, R. S.	NAG 5-1092	5790
19	UNIV TEXAS-AUSTIN	Owens, F. C.	HQ-XE	Evans, N. J.	NGT 00-050-320	5844
19	UNIV TEXAS-DALLAS	Bullock, G. D.	GSFC	Hanson, W.	NAG 5-305	5860
19	UNIV TEXAS-DALLAS	Bullock, G. D.	GSFC	Heelis, R. A.	NAG 5-306	5861
19	UNIV TEXAS-DALLAS	Blanchard, R. C.	LARC	Hoffman, J. H.	NAS 1-17399	5871
19	U TEX MED BRANCH-GAL	Goldstein, S. H.	JSC	Nechay, B. R.	NAG 9-315	5898

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19	UNIV OF TOLEDO	Bullock, G. D.	GSFC	Anderson, L. S.	NAG 5-1069	5165
19	UNIV OF TOLEDO	Morren, W. E.	LERC	Dewitt, K. J.	NAG 3-577	5145
19	UNIV OF VIRGINIA	Nuth, J. A.	GSFC	Lilleleht, L. U.	NAG 5-865	6115
19	UNIV OF VIRGINIA	Cyphers, H.	GSFC	O'connel, R.	NAS 5-28613	6136
19	UNIV OF VIRGINIA	Sachse, G. W.	LARC	Gallagher, T. F.	NAG 1-701	6103
19	UNIV WISC-MADISON	Oseroff, H.	GSFC	Diak, G. R.	NAG 5-854	6394
19	UNIV WISC-MADISON	Asrar, G.	HQ-EE	Norman, J.	NAGW 1469	6420
19	UTAH STATE UNIV	Bullock, G. D.	GSFC	Sojka, J. J.	NAG 5-748	5944
19	UTAH STATE UNIV	Purvis, C. K.	LERC	Raitt, W. J.	NAG 3-792	5940
19	COLLEGE OF WM & MARY	Phillips, D. H.	LARC	Krakauer, H.	NCC 1-77	5985
19	VA MILITARY INST	Browne, I. D.	JSC	Schreider, H. D.	NAG 9-102	6163
19	VIRGINIA STATE UNIV	Wilson, J. W.	LARC	Stronach, C. E.	NAG 1-416	6245
19	VIRGINIA STATE UNIV	Wilson, J. W.	LARC	Stith, J. J.	NAG 1-765	6247
19	WASHINGTON UNIVERSTY	Evans, D.	HQ-EE	Arvidson, R. E.	NASW 4017	4209
19	WASHINGTON UNIVERSTY	Quaide, W. L.	HQ-EL	McKinnon, W. B.	NAGW 1215	4202
19	WELLESLEY COLLEGE	Quaide, W. L.	HQ-EL	French, R. G.	NAGW 1497	3933
19	WEST VA STATE COL	Sutton, J. F.	GSFC	Spaniol, C.	NAG 5-1267	6352
19	WEST VIRGINIA UNIV	Chai, A. T.	LERC	Lyell, M. J.	NAG 3-1005	6358
19	YALE UNIVERSITY	Stearns, C. A.	LARC	Rosner, D.	NAG 3-884	2596
21	ATLANTA UNIVERSITY	Shoosmith, J. N.	LARC	Mickens, R. E.	NAG 1-410	2831
21	BROWN UNIVERSITY	Armstrong, E. S.	LARC	Banks, H. T.	NAG 1-517	5415
21	CARNEGIE-MELLON UNIV	Owens, F. C.	HQ-XE	Shafer, S. A.	NGT 00-050-423	5243
21	CASE WESTERN RESERVE	Decker, A. J.	LERC	Izen, S. H.	NAG 3-832	4878
21	CLEVELAND STATE UNIV	Owens, F. C.	HQ-XE	Kramerich, G. L.	NGT 00-070-073	4989
21	DUKE UNIVERSITY	Ford, W. F.	LERC	Smith, D. A.	NSG 3160	4767
21	HAMPTON UNIVERSITY	Smith, R. E.	LARC	Lam, M.	NAG 1-760	6003
21	HAMPTON UNIVERSITY	Hardin, J. C.	LARC	Miamec, A. G.	NAG 1-768	6005
21	HAMPTON UNIVERSITY	Smith, R. E.	LARC	Lam, M.	NAG 1-948	6011
21	HARVEY MUDD COLLEGE	Kehoe, M. W.	ARC	Krieger, H.	NCA 2-292	1619
21	HARVEY MUDD COLLEGE	Kehoe, M. W.	ARC	Coleman, C.	NCA 2-359	1620
21	KANSAS STATE UNIV	Owens, F. C.	HQ-LE	Asrar, G.	NGT 17-002-801	3350
21	LA ST U&A&M COL-BRGE	Fox, K.	HQ-EL	Henry, R. J.	NAGW 48	3400
21	MISSISSIPPI STATE U	Smith, R. E., Jr.	LARC	Thompson, J. F.	NSG 1577	4164
21	NORTHWESTERN UNIV	Rummel, J.	HQ-EB	Eirich, F.	NGT 00-050-012	3014
21	NORTHWESTERN UNIV	Owens, F. C.	HQ-XE	Davis, S. H.	NGT 00-050-502	3015
21	OLD DOMINION UNIV	Owens, F. C.	HQ-XE	Swits, J.	NGT 00-050-346	6082
21	OLD DOMINION UNIV	Owens, F. C.	HQ-XE	Swetits, J.	NGT 00-050-399	6084
21	OLD DOMINION UNIV	Owens, F. C.	HQ-XE	Heinbackel, J. H.	NGT 00-070-105	6090
21	OLD DOMINION UNIV	Owens, F. C.	HQ-XE	Alberts, T. E.	NGT 00-070-124	6092
21	SAN JOSE STATE UNIV	Jaffe, R.	ARC	Morris, H.	NCA 2-438	1660
21	SO UNIV & A&M COL-BR	Halpern, R. E.	HQ-SU	Roquiemore, L.	NAGW 701	3416
21	UNIV ALA-HUNTSVILLE	Black, R. E.	MSFC	Kaukler, W. F.	NAG 8-511	1117
21	UNIV OF ARIZONA	Owens, F. C.	HQ-XE	Pearlstein, A. J.	NGT 00-050-307	1459
21	UNIV CALIF-DAVIS	Flores, J.	ARC	Cheer, A. Y.	NCA 2-172	2022
21	UNIV CALIF-L ANGELES	Warming, R.	ARC	Engquist, B.	NCA 2-372	2138
21	UNIV CALIF-L ANGELES	Owens, F. C.	HQ-XE	Osher, S. J.	NGT 00-070-125	2155
21	UNIV COLORADO-DENVER	Owens, F. C.	HQ-XE	McCormick, S. F.	NGT 00-050-403	2572
21	UNIV HOUSTON-HOUSTON	Savely, R. T.	JSC	Johnson, G. G.	NAG 9-371	5732
21	UNIV HOUSTON-HOUSTON	Owens, F. C.	HQ-XE	Lacy, C. E.	NGT 00-050-276	5748
21	UNIV ILLINOIS-URBANA	Murray, N. D.	LARC	Campbell, R. H.	NSG 1471	3164
21	UNIV MARYLAND-COL PK	Celmer, J. J.	GSFC	Chen, J.	NAG 5-1019	3551
21	UNIV MICH-ANN ARBOR	Thomas, J. L.	LARC	Van Leer, B.	NAG 1-869	3979
21	UNIV OF SO FLORIDA	Jones, H. W.	ARC	Deans, S. R.	NCC 2-580	2829
21	UNIV OF WASHINGTON	Yee, H. C.	ARC	Leveque, R. J.	NCA 2-185	6323
21	UNIV OF WYOMING	Holst, T. L.	ARC	George, J. H.	NCA 2-376	6471
21	WEST VIRGINIA UNIV	Zorunski, W. E.	LARC	Gingold, H.	NAG 1-741	6354
22	ALABAMA A&M UNIV	Randall, J. L.	MSFC	Saha, H.	NAG 8-24	1001
22	ARIZONA STATE UNIV	Quaide, W. L.	HQ-EL	Anderson, D. L.	NASW 4098	1269
22	ATLANTA UNIVERSITY	Owens, F. C.	HQ-LE	Warsi, N. A.	NGT 00-050-106	2835
22	AUBURN UNIV-AUBURN	Shackleford, K.	MSFC	Brown, D. B.	NCC 8-14	1046

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22	BOWIE STATE COLLEGE	Kork, J.	GSFC	Bhatia, M. S.	NAG 5-715	3442
22	BOWIE STATE COLLEGE	Truszkowski, W. F.	GSFC	Srivastava, S.	NAS 5-30296	3444
22	BOWIE STATE COLLEGE	Margolis, M.	HQ-U	Kirksey, C. H.	NGT 00-090-016	3445
22	BROOKLYN COLLEGE	Owens, F. C.	HQ-XE	Harrow, K.	NGT 00-050-533	4430
22	BROWN UNIVERSITY	Owens, F. C.	HQ-XE	Vitter, J. S.	NGT 00-050-420	5442
22	CARNEGIE-MELLON UNIV	Ochoa, E.	ARC	Casasent, D.	NCA 2-300	5240
22	CARNEGIE-MELLON UNIV	Friedland, P. E.	ARC	Mitchell, T.	NCC 2-463	5241
22	CARNEGIE-MELLON UNIV	Rosenthal, D. A.	ARC	Smith, S. F.	NCC 2-531	5242
22	CARNEGIE-MELLON UNIV	Dorband, J. E.	GSFC	Siewiorek, D. P.	NAG 5-1046	5233
22	CASE WESTERN RESERVE	Bobinsky, E. A.	LERC	Sterling, L.	NAG 3-907	4883
22	CATHOLIC UNIVERSITY	Jacobs, B.	GSFC	Welch, J. N.	NAG 5-311	2635
22	CLEMSON UNIV-CLEMSON	Owens, F. C.	HQ-XE	Collins, A.	NGT 00-050-419	5473
22	CLEMSON UNIV-CLEMSON	Owens, F. C.	HQ-XE	Grist, R. M.	NGT 00-070-028	5474
22	CLEMSON UNIV-CLEMSON	Owens, F. C.	HQ-LE	Geist, R.	NGT 00-050-005	5470
22	CLEMSON UNIV-CLEMSON	Owens, F. C.	HQ-LE	Schalkoff, R. J.	NGT 00-050-090	5471
22	CLEVELAND STATE UNIV	Owens, F. C.	HQ-XE	Anthas, D.	NGT 00-070-083	4990
22	COLORADO STATE UNIV	Graves, R. A.	HQ-LE	Burns, P. J.	NGT 06-002-802	2402
22	CORNELL UNIVERSITY	Lum, H.	ARC	Birman, K. P.	NAG 2-593	4516
22	CORNELL UNIVERSITY	Owens, F. C.	HQ-XE	Hopcroft, J. E.	NGT 00-050-327	4583
22	DARTMOUTH COLLEGE	Fernquist, A. R.	ARC	Bishop, M. A.	NAG 2-480	4261
22	DUKE UNIVERSITY	Storaasli, O. O.	LARC	Patrick, M. L.	NAG 1-466	4752
22	FOOTHILL-DEANZA SYST	Lum, H.	ARC	Frederick, V.	NCC 2-342	1618
22	FISK UNIVERSITY	Key, C. F.	MSFC	Springer, J. M.	NAS 8-36166	5491
22	GEORGE WASHINGTON U	Truszkowski, W. F.	GSFC	Sibert, J. L.	NAS 5-30092	2672
22	GEORGIA INST OF TECH	Truszkowski, W. F.	GSFC	Mitchell, C. M.	NAG 5-1044	2870
22	GEORGIA INST OF TECH	Murray, N. D.	LARC	Lablanc, R. J.	NAG 1-430	2840
22	GEORGIA INST OF TECH	Owens, F. C.	HQ-XE	Kangari, R.	NGT 00-050-498	2899
22	HAMPTON UNIVERSITY	Bryant, W. H.	LARC	Cezzar, R.	NAG 1-949	6012
22	HUMBOLDT STATE UNIV	Jones, W. P.	ARC	Blaisdell, J. H.	NCA 2-237	1621
22	HUMBOLDT STATE UNIV	Jones, W. P.	ARC	Blaisdell, J. H.	NCC 2-639	1622
22	IOWA STATE UNIV	Le, C.	KSC	Fullmer, R.	NAS10-11540	3279
22	IOWA STATE UNIV	Owens, F. C.	HQ-XE	Oldehoeft, A. E.	NGT 00-050-269	3288
22	JACKSON STATE UNIV	Galle, R. A.	SSC	Leflore, R. M.	NCC13-1	4144
22	JACKSON STATE UNIV	Margolis, M.	HQ-U	Lupton, W. L.	NAGW 1759	4143
22	LINCOLN UNIV-PA	Alterescu, S.	GSFC	Frankowsk, J. W.	NAS 5-28566	5270
22	LA ST U&A&M COL-BRGE	Jacobs, B.	GSFC	Iyengar, S. S.	NAG 5-540	3397
22	MASS INST OF TECH	Friedland, P. E.	ARC	Sheridan, T.	NCC 2-360	3852
22	MASS INST OF TECH	Friedland, P. E.	ARC	Young, L. R.	NCC 2-570	3855
22	NEW MEX ST U-LAS CR	Stevens, K. G.	ARC	Hills, R. G.	NAG 2-474	4384
22	NEW MEX ST U-LAS CR	Lerdal, R.	JSC	Craddock, W. L.	NAS 9-95618	4401
22	NEW MEX ST U-LAS CR	Owens, F. C.	HQ-XE	Becker, J. F.	NGT 00-070-079	4406
22	NO CAR A&T STATE U	Goode, P. W.	LARC	Ntuen, C. A.	NAG 1-763	4771
22	NO CAROLINA STATE U	Eckhardt, D. E., Jr.	LARC	McAllister, D. F.	NAG 1-667	4784
22	NO CAROLINA STATE U	Morris, W. D.	LARC	Bengtson, N. M.	NAG 1-792	4788
22	NO CAROLINA STATE U	Farmer, F. H.	LARC	Rasdorf, W. J.	NAG 1-883	4789
22	NO CAROLINA STATE U	Eckhardt, D. E.	LARC	Vouk, M. A.	NAG 1-983	4793
22	NORWICH UNIVERSITY	Stilwell, D.	JSC	Bartram, P. N.	NAG 9-312	5961
22	OHIO STATE UNIV	Owens, F. C.	HQ-LE	Smith, P.	NGT 00-050-078	5062
22	OHIO UNIVERSITY	Howell, W. E.	LARC	Hill, H. W.	NAG 1-940	5071
22	OLD DOMINION UNIV	Eckhardt, D. E.	LARC	Wild, C. D.	NAG 1-439	6031
22	OLD DOMINION UNIV	Eckhardt, D. E.	LARC	Lee, L. D.	NAG 1-835	6048
22	OLD DOMINION UNIV	Murray, N. D.	LARC	Maly, K.	NAG 1-908	6054
22	OLD DOMINION UNIV	Shipman, F. S.	LARC	Shen, S. N.	NAG 1-920	6055
22	OLD DOMINION UNIV	Solonay, D.	LARC	Livingston, D. L.	NAG 1-962	6058
22	OLD DOMINION UNIV	Eckhardt, D. E.	LARC	Wild, C.	NAG 1-966	6059
22	OLD DOMINION UNIV	Walker, C. K.	LARC	Wild, J. C.	NAG 1-1026	6063
22	OLD DOMINION UNIV	Rehder, J. J.	LARC	Schwing, J. L.	NCC 1-99	6073
22	OLD DOMINION UNIV	Owens, F. C.	HQ-XE	Wilson, L.	NGT 00-070-106	6091
22	PENN STATE U-UNIV PK	Campbell, W. J.	GSFC	Peuquet, D. J.	NAG 5-798	5313
22	PENN STATE U-UNIV PK	McDonald, K. R.	GSFC	Peuquet, D. J.	NAG 5-997	5316

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22	POLYTECHNIC U	Meissner, C. W.	LARC	Shooman, M. L.	NAG 1-1001	4618
22	PURDUE UNIVERSITY	Murray, N. D.	LARC	Bhargava, B.	NAG 1-676	3193
22	RICE UNIVERSITY	Jones, W. P.	ARC	Almes, G. T.	NAG 2-579	5578
22	SANTA CLARA UNIV	Stevens, K.	ARC	Alkhatib, H.	NCA 2-213	2344
22	SANTA CLARA UNIV	Yin, J.	ARC	Alkhatib, H. A.	NCC 2-554	2352
22	SANTA CLARA UNIV	Yin, J.	ARC	Alkhatib, H. S.	NCC 2-621	2353
22	SO UNIV & A&M COL-BR	Wilson, J.	HQ-NI	Roquemore, L.	NGT 19-010-900	3420
22	SO UNIV & A&M COL-BR	Wilson, J. H.	HQ-NT	Roquemore, L.	NGT 00-090-022	3419
22	STANFORD UNIVERSITY	Stevens Jr., K. G.	ARC	Lundstrom, S. F.	NAG 2-248	1698
22	STANFORD UNIVERSITY	Friedland, P. E.	ARC	Feigenbaum, E. A.	NAG 2-581	1704
22	STANFORD UNIVERSITY	Beam, R. M.	ARC	Oliger, J.	NCA 2-150	1760
22	STANFORD UNIVERSITY	Jespersen, D.	ARC	Golub, G.	NCA 2-233	1765
22	STANFORD UNIVERSITY	Kwak, D.	ARC	Oliger, J.	NCA 2-440	1800
22	STANFORD UNIVERSITY	Friedland, P. E.	ARC	Nilsson, N. J.	NCC 2-494	1816
22	STANFORD UNIVERSITY	Friedland, P. E.	ARC	Leifer, L.	NCC 2-514	1818
22	STANFORD UNIVERSITY	Friedland, P. E.	ARC	Buchanan, B. G.	NCC 2-537	1821
22	STANFORD UNIVERSITY	Sridhar, B.	ARC	Binford, T. O.	NCC 2-574	1825
22	STANFORD UNIVERSITY	Lum, H.	ARC	Street, R. L.	NCC 2-633	1828
22	STANFORD UNIVERSITY	Spears, J. M.	KSC	Banks, P. M.	NCC10-1	1832
22	STANFORD UNIVERSITY	Owens, F. C.	HQ-XE	Shortliffe, E.	NGT 00-050-168	1842
22	STANFORD UNIVERSITY	Smith, P. H.	HQ-RC	Banks, P. M.	NAGW 419	1730
22	STATE UNIV NY-BUFFAL	Murray, N. D.	LARC	Wittie, L. D.	NAG 1-249	4684
22	SYRACUSE UNIVERSITY	Finelli, G. B.	LARC	Goel, A. L.	NAG 1-806	4736
22	TEXAS A&M UNIVERSITY	Lum, H.	ARC	Volz, R. A.	NCC 2-601	5682
22	UNIV ALA-BIRMINGHAM	Owens, F. C.	HQ-LE	McAnulty, M.	NGT 02-002-800	1086
22	UNIV ALA-HUNTSVILLE	Ogilvie, K.	GSFC	Torbert, R. B.	NAS 5-30540	1154
22	UNIV ALA-HUNTSVILLE	Edge, T. M.	MSFC	Olson, L. H.	NAG 8-83	1102
22	UNIV ALA-HUNTSVILLE	Freeman, M. S.	MSFC	Johannes, J. D.	NAG 8-117	1111
22	UNIV ALA-HUNTSVILLE	Weeks, D.	MSFC	Ford, D. R.	NAG 8-642	1120
22	UNIV ALA-HUNTSVILLE	Whitehead, N. D.	MSFC	McKee, J. W.	NAG 8-720	1132
22	UNIV ALA-HUNTSVILLE	Vinz, F. L.	MSFC	Ranganath, H. S.	NCC 8-16	1183
22	UNIV ALA-HUNTSVILLE	Owens, F. C.	HQ-LE	Rosenberger, F.	NGT 00-050-129	1186
22	UNIV ALA-UNIVERSITY	Haley, A. D.	MSFC	Carroll, C. C.	NAG 8-93	1195
22	UNIV ALA-UNIVERSITY	Thomas, L. D.	MSFC	Yeager, D. P.	NAG 8-718	1198
22	UNIV OF ARIZONA	Friedland, P. E.	ARC	Nunamaker, J. F.	NAG 2-533	1299
22	UNIV OF ARIZONA	Friedland, P. E.	ARC	Zeigler, B. P.	NCC 2-525	1436
22	UNIV OF ARIZONA	Jones, W. P.	ARC	Peterson, L.	NCC 2-561	1437
22	UNIV CALIF-BERKELEY	Friedland, P. E.	ARC	Stonebraker, M. R.	NAG 2-530	1868
22	UNIV CALIF-BERKELEY	Tweten, D. E.	ARC	Katz, R. H.	NAG 2-591	1870
22	UNIV CALIF-BERKELEY	Stevens, K. G.	ARC	Smith, A. J.	NCA 2-128	1941
22	UNIV CALIF-BERKELEY	Friedland, P. E.	ARC	Zadeh, L.	NCC 2-275	1963
22	UNIV CALIF-BERKELEY	Stevens, K. G.	ARC	Smith, A. J.	NCC 2-550	1965
22	UNIV CALIF-BERKELEY	Owens, F. C.	HQ-XE	Russell, S. J.	NGT 00-050-166	1980
22	UNIV CALIF-IRVINE	Eckhardt, D. E., Jr.	LARC	Leveson, N. G.	NAG 1-668	2042
22	UNIV CALIF-SAN DIEGO	Goforth, A.	ARC	Collard, P.	NCC 2-603	2249
22	UNIV CALIF-SAN DIEGO	Scudder, J.	GSFC	Fillius, W.	NAS 5-30549	2239
22	UNIV CALIF-S BARBARA	Eckhardt, D. E.	LARC	Kelly, J. P.	NAG 1-782	2284
22	UNIV COLORADO-BOLDR	Tong, G. M.	GSFC	Hansen, E. R.	NAS 5-29174	2518
22	UNIV COLORADO-BOLDR	West, D. K.	GSFC	Brugel, D. E.	NAS 5-30567	2525
22	UNIV COLORADO-BOLDR	Schmerling, E.	HQ-EC	Hansen, E. R.	NAGW 1121	2484
22	UNIV DIST COLUMBIA	Margolis, M.	HQ-U	Coleman, W. R.	NGT 05-050-902	2709
22	UNIV OF FLORIDA	Owens, F. C.	HQ-XE	Grams, R.	NGT 00-070-021	2799
22	UNIV OF FLORIDA	Owens, F. C.	HQ-XE	Grams, R.	NGT 00-070-022	2800
22	UNIV OF HAWAII-MANOA	Jones, W. P.	ARC	Nielsen, T. N.	NAG 2-560	2924
22	UNIV HOUSTON-HOUSTON	Jacobs, B. E.	GSFC	Huang, S. S.	NAG 5-739	5713
22	UNIV HOUSTON-HOUSTON	Gilbert, J. R.	JSC	Rusinkiewicz, M. E.	NAG 9-195	5716
22	UNIV HOUSTON-HOUSTON	Suddath, J. H.	JSC	Bourgeois, B.	NAG 9-274	5725
22	UNIV HOUSTON-HOUSTON	Goldstein, S. H.	JSC	Johnson, D. S.	NAG 9-398	5736
22	UNIV HOUSTON-CL LAKE	MacDonald, R. B.	JSC	Dickerson, E. T.	NCC 9-16	5756
22	UNIV ILLINOIS-URBANA	Grant, T. L.	ARC	Iyer, R. K.	NCA 2-301	3143

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22	UNIV ILLINOIS-URBANA	Lum, H.	ARC	Iyer, R. K.	NCA 2-385	3145
22	UNIV ILLINOIS-URBANA	Lum, H.	ARC	Wah, B. W.	NCC 2-481	3148
22	UNIV ILLINOIS-URBANA	Lum, H.	ARC	Kuck, D. J.	NCC 2-559	3149
22	UNIV ILLINOIS-URBANA	Carreno, V. A.	LARC	Iyer, R. K.	NAG 1-602	3105
22	UNIV ILLINOIS-URBANA	Bryant, W. H.	LARC	Liu, J. W.	NAG 1-613	3106
22	UNIV ILLINOIS-URBANA	Abbott, K. H.	LARC	Forbus, K. D.	NAG 1-1023	3109
22	UNIV ILLINOIS-URBANA	Owens, F. C.	HQ-XE	Wah, B.	NGT 00-050-349	3155
22	UNIV ILLINOIS-URBANA	Owens, F. C.	HQ-XE	Wan, B.	NGT 00-050-442	3159
22	UNIVERSITY OF LOWELL	Cleghorn, T.	JSC	Krolak, P. D.	NAG 9-391	3898
22	UNIV MARYLAND-COL PK	Lum, H.	ARC	Shneiderman, B.	NCC 2-474	3607
22	UNIV MARYLAND-COL PK	Lum, H.	ARC	Agrawala, A. K.	NCC 2-519	3608
22	UNIV MARYLAND-COL PK	Lum, H.	ARC	Davis, L. S.	NCC 2-560	3609
22	UNIV MARYLAND-COL PK	Vranish, J. M.	GSFC	Baras, J. S.	NAG 5-1047	3553
22	UNIV MARYLAND-COL PK	Jacobs, B. E.	GSFC	Roussopoulos, N.	NAG 5-1271	3565
22	UNIV MARYLAND-COL PK	McGarry, F. E.	GSFC	Basili, V. R.	NSG 5123	3635
22	UNIV MARYLAND-COL PK	Solonay, D.	LARC	Reggia, J. A.	NAG 1-885	3514
22	UNIV OF MASS-AMHERST	Lum, H.	ARC	Kurose, J. F.	NAG 2-595	3904
22	UNIV MICH-ANN ARBOR	Friedland, P. E.	ARC	Volz, R. A.	NAG 2-350	3984
22	UNIV MICH-ANN ARBOR	Friedland, P. E.	ARC	Volz, R. A.	NCC 2-517	4067
22	UNIV MICH-ANN ARBOR	Butler, R. W.	LARC	Shin, K. G.	NAG 1-296	3975
22	UNIV MICH-ANN ARBOR	Butler, R. W.	LARC	Shin, K. G.	NAG 1-492	3976
22	UNIV MICH-ANN ARBOR	Elks, C. R.	LARC	Shin, K. C.	NAG 1-887	3980
22	UNIV MICH-ANN ARBOR	White, A. L.	LARC	Shin, K. G.	NAG 1-981	3981
22	U MINN-MNPLS-ST PAUL	Alexander, J. K.	HQ-E	Yuen, D. A.	NAGW 1584	4120
22	UNIV N CAR-CHPL HILL	Lum, H.	ARC	Watanabe, H.	NAG 2-570	4824
22	UNIV OREGON-EUGENE	Remington, R. W.	ARC	Fuller, C. A.	NAG 2-383	5221
22	UNIV OF PENNSYLVANIA	Owens, F. C.	HQ-XE	Badler, N.	NGT 00-050-063	5392
22	UNIV OF PENNSYLVANIA	Owens, F. C.	HQ-LE	Finin, T.	NGT 00-050-066	5393
22	UNIV OF RICHMOND	Holloway, C. M.	LARC	Charlesworth, A.	NAG 1-774	6098
22	UNIV OF SO FLORIDA	Lim, R. S.	ARC	Hall, L. O.	NAG 2-487	2823
22	UNIV OF SOUTHERN CAL	Friedland, P. E.	ARC	Uncapher, K. W.	NAG 2-532	2356
22	UNIV OF SOUTHERN CAL	Friedland, P. E.	ARC	Ohlander, R. B.	NCC 2-520	2368
22	UNIV OF SOUTHERN CAL	Friedland, P.	ARC	Rosenbloom, P.	NCC 2-538	2369
22	UNIV OF SOUTHERN CAL	Lum, H.	ARC	Mizell, D. W.	NCC 2-539	2370
22	UNIV OF SOUTHERN CAL	Tobias, L.	ARC	Inselberg, A.	NCC 2-587	2371
22	UNIV SO MISSISSIPPI	Barlow, R. M.	SSC	Huffman, G. D.	NAS13-326	4170
22	UNIV SO MISSISSIPPI	Bivins, R. G.	HQ	Huffman, D.	NASW 4320	4169
22	UNIV TENNESSEE-CHAT	Weeks, D. J.	MSFC	Bykat, A.	NAG 8-105	5502
22	UNIV TEXAS-AUSTIN	Glass, B. J.	ARC	Kuipers, B. J.	NAG 2-507	5772
22	UNIV TEXAS-AUSTIN	Zweben, M.	ARC	Mooney, R.	NCC 2-629	5831
22	UNIV TEXAS-AUSTIN	Abbott, L.	JSC	Malek, M.	NAG 9-351	5806
22	UNIV TEXAS-AUSTIN	Baker, K.	JSC	Nandhakumar, N.	NAG 9-361	5809
22	UNIV TEXAS-AUSTIN	Carroll, S. N.	MSFC	Wie, B.	NAS 8-36224	5826
22	UNIV TEXAS-AUSTIN	Owens, F. C.	HQ-XE	Schutz, B. E.	NGT 00-050-422	5845
22	UNIV TEXAS-EL PASO	Healey, K.	JSC	Patterson, D.	NAG 9-285	5883
22	UNIV OF TOLEDO	Jacobs, B.	GSFC	Kertz, G.	NAG 5-586	5160
22	UNIV OF TOLEDO	Stevens, G. H.	LERC	Kwatra, S. C.	NAG 3-157	5144
22	UNIV OF VIRGINIA	Bryant, W. H.	LARC	Ortega, J. M.	NAG 1-242	6100
22	UNIV OF VIRGINIA	Delaat, J. C.	LERC	Weaver, A. C.	NAG 3-630	6110
22	UNIV OF VIRGINIA	Owens, F. C.	HQ-XE	Martin, W. N.	NGT 00-070-051	6149
22	UNIV OF VIRGINIA	Owens, F. C.	HQ-XE	Martin, W. N.	NGT 00-070-052	6150
22	UNIV WISC-MADISON	Jones, W. P.	ARC	Landweber, L. H.	NAG 2-583	6377
22	UNIV WISC-MADISON	Villasenor, A. J.	HQ-EC	Landweber, L. H.	NAGW 1318	6418
22	COLLEGE OF WM & MARY	Sjogren, J. A.	LARC	Kearns, J. P.	NAG 1-787	5971
22	COLLEGE OF WM & MARY	Eckhardt, D. E.	LARC	Miller, K. W.	NAG 1-884	5973
22	COLLEGE OF WM & MARY	Johnson, S. C.	LARC	Morell, L. J.	NAG 1-894	5974
22	COLLEGE OF WM & MARY	Sliwa, N. E.	LARC	Bynum, W. L.	NAG 1-906	5976
22	COLLEGE OF WM & MARY	Keynton, R. J.	LARC	Nicol, D. M.	NAG 1-995	5977
22	COLLEGE OF WM & MARY	Bryant, W. H.	LARC	Nichol, D. M.	NAG 1-1060	5980
22	COLLEGE OF WM & MARY	Schutte, P. C.	LARC	Feyock, S.	NCC 1-122	5987

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22	COLLEGE OF WM & MARY	Owens, F. C.	HQ-LE	Miller, K.	NGT 00-050-052	5989
22	COLLEGE OF WM & MARY	Owens, F. C.	HQ-LE	Park, S. K.	NGT 00-050-111	5990
22	COLLEGE OF WM & MARY	Owens, F. C.	HQ-LE	Park, S. K.	NGT 00-050-117	5991
22	VIRGINIA POLY INST	O'Brien, M. E.	GSFC	Schaffer, C. A.	NAG 5-1183	6213
22	WESTERN MICHIGAN U	Hollansworth, J. E.	LERC	Kerstetter, M. C.	NAG 3-1025	4096
22	WORCESTER POLY INST	Chin, G.	GSFC	Boriakoff, F. U.	NAG 5-1138	3952
22	WORCESTER POLY INST	Johnson, S. C.	LARC	Green, P. E.	NAG 1-809	3949
22	WORCESTER POLY INST	Johnson, S. C.	LARC	Green, P. E.	NAG 1-964	3950
22	YALE UNIVERSITY	Sjogren, J. A.	LARC	Smith, R. M.	NAG 1-897	2592
29	ATLANTA UNIVERSITY	Goode, P. W.	LARC	Warsi, N. A.	NAG 1-412	2832
29	BOWIE STATE COLLEGE	Bonavito, N. L.	GSFC	Bhatia, M. S.	NAG 5-499	3441
29	CAL STATE U-NRTHRDE	Steger, J. L.	ARC	Seki, R.	NCC 2-515	1614
29	CARNEGIE-MELLON UNIV	McKellar, D.	ARC	Siewiorek, D.	NAS 2-13045	5239
29	CLEMSON UNIV-CLEMSON	Bavuso, S. J.	LARC	Geist, R. S.	NAG 1-755	5454
29	CLEMSON UNIV-CLEMSON	Liceaga, C. A.	LARC	Geist, R. M.	NAG 1-1024	5459
29	CLEVELAND STATE UNIV	Glasgow, T. K.	LERC	Kramerich, G. L.	NCC 3-41	4965
29	COLUMBIA UNIVERSITY	Smith Jr., R. E.	LARC	Eiseman, P. R.	NAG 1-427	4452
29	COLUMBIA UNIVERSITY	Choo, Y. K.	LERC	Eiseman, P. R.	NAG 3-877	4458
29	DUKE UNIVERSITY	Bavuso, S. J.	LARC	Trivedi, K. S.	NAG 1-70	4751
29	FURMAN UNIVERSITY	Hill, E.	MSFC	Abernethy, K.	NAG 8-646	5477
29	GEORGE WASHINGTON U	Finelli, G. B.	LARC	Miller, D. R.	NAG 1-771	2658
29	HAMPTON UNIVERSITY	Hogge, J. E.	LARC	Walker, R. L.	NAG 1-789	6006
29	HAMPTON UNIVERSITY	Thurston, G. A.	LARC	Fulton, J. P.	NAG 1-1035	6014
29	IOWA STATE UNIV	Sewall, W. G.	LARC	Tannehill, J. C.	NAG 1-645	3261
29	MISSISSIPPI STATE U	Blech, R. A.	LERC	Trotter, J. D.	NAG 3-1073	4150
29	MISSISSIPPI STATE U	Parker, G.	MSFC	Ingels, F. M.	NAS 8-36717	4157
29	MT HOLYOKE COLLEGE	White, B. L.	HQ	Morrow, J.	NAGW 1792	3889
29	NEW MEX ST U-LAS CR	Alexander, J. K.	HQ-E	Barnden, J. A.	NAGW 1592	4393
29	NORFOLK STATE UNIV	Lambiotte, J. J.	LARC	Shah, S. N.	NAG 1-764	6023
29	NORTHWESTERN UNIV	Bavuso, S. J.	LARC	Lewis, E. E.	NAG 1-1031	2992
29	OLD DOMINION UNIV	Hayhurst, K. J.	LARC	Wilson, L.	NAG 1-750	6042
29	OLD DOMINION UNIV	Finelli, G. B.	LARC	Overstreet, C. M.	NAG 1-902	6053
29	RENSSELAER POLY-NY	Woo, A. C.	ARC	Shephard, M.	NCA 2-319	4645
29	SAN JOSE STATE UNIV	Tobias, L.	ARC	Wang, J. C.	NCC 2-595	1678
29	SPELMAN COLLEGE	Goode, P. W.	LARC	Martin, B. J.	NAG 1-712	2910
29	STANFORD UNIVERSITY	Lum, H.	ARC	Flynn, M. J.	NCA 2-338	1784
29	STANFORD UNIVERSITY	Olsen, G. C.	LARC	Hughes, T. J.	NAG 1-361	1690
29	STATE UNIV NY-BUFFAL	Juang, J. N.	LARC	Mook, D. J.	NAG 1-950	4687
29	STEVENS INST OF TECH	Bavuso, S. J.	LARC	Swern, F. L.	NAG 1-587	4372
29	STEVENS INST OF TECH	Margolis, M. S.	HQ-U	Prather, E. N.	NGT 00-090-008	4373
29	TEXAS TECH UNIV	Chapman, G. T.	ARC	Martin, C. F.	NAG 2-403	5707
29	UNIV OF AKRON	Tanner, J. A.	LARC	Padovan, J.	NAG 1-444	5077
29	UNIV OF AKRON	Petrik, E. J.	LERC	Durkin, J.	NAG 3-923	5096
29	UNIV ALA-HUNTSVILLE	Martin, C.	MSFC	Chung, T. J.	NAG 8-627	1118
29	UNIV ALA-HUNTSVILLE	Wolfsberger, J. W.	MSFC	Ford, D. R.	NAG 8-641	1119
29	UNIV ALA-HUNTSVILLE	Jones, C. O.	MSFC	Caulfield, H. J.	NAG 8-777	1137
29	UNIV ALA-HUNTSVILLE	Kaufman, J. W.	MSFC	Mc nider, R. T.	NAS 8-36718	1164
29	UNIV ALA-UNIVERSITY	Patel, S.	MSFC	Bation, R. G.	NAG 8-703	1197
29	UNIV CALIF-L ANGELES	Anderson, K. F.	ARC	Yao, K.	NAG 2-303	2061
29	UNIV CALIF-SAN DIEGO	Goforth, A.	ARC	Arnold, J. R.	NAG 2-506	2172
29	UNIV CALIF-S CRUZ	Vaziri, A.	ARC	Wilhelms, J.	NCA 2-430	2324
29	UNIV OF CINCINNATI	Petrik, E. J.	LERC	Ramamoorthy, P. A.	NAG 3-960	5121
29	UNIV COLORADO-BOLDR	Storaasli, O. O.	LARC	Jordan, H.	NAG 1-640	2403
29	UNIV COLORADO-BOLDR	Bredenkamp, J.	HQ-EC	Hansen, E. R.	NAGW 1095	2481
29	UNIV HOUSTON-HOUSTON	Tobak, M.	ARC	Golubitsky, M.	NAG 2-432	5708
29	UNIV HOUSTON-HOUSTON	Savely, R. T.	JSC	Johnson, G. G.	NAG 9-210	5718
29	UNIV MARYLAND-COL PK	Tischler, M.	ARC	Fan, M.	NCA 2-309	3602
29	UNIV MARYLAND-COL PK	Tischler, M. B.	ARC	Celi, R.	NCA 2-310	3603
29	UNIV MARYLAND-COL PK	Yee, H. C.	ARC	Grebogi, C.	NCA 2-435	3604
29	UNIV MARYLAND-COL PK	Brown, R.	GSFC	Vernekar, A. D.	NCA 5-110	3605

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29	UNIV OF MASS-AMHERST	Bailey, M. C.	LARC	Yngvesson, S.	NAS 1-18310	3918
29	UNIV MICH-ANN ARBOR	Lum, H.	ARC	Volz, R. A.	NCA 2-341	4066
29	UNIV OF PENNSYLVANIA	Woolford, B. J.	JSC	Altschuler, M. D.	NAS 9-17003	5390
29	UNIV OF SO FLORIDA	Goode, P. W.	LARC	Varanasi, M. R.	NAG 1-632	2822
29	UNIV TENNESSEE-KNOXV	Knight, N. F.	LARC	George, J. A.	NAG 1-803	5505
29	UNIV OF WALES	Bey, K. S.	LARC	Morgan, K.	NAGW 478	6494
29	UNIV OF WATERLOO	Knight, N. F.	LARC	George, J. A.	NAGW 1457	6489
29	VANDERBILT UNIVERSTY	Fernandez, K. R.	MSFC	Cook, G. E.	NAG 8-690	5534
29	COLLEGE OF WM & MARY	Liceaga, C. A.	LARC	Morrell, L. J.	NAG 1-824	5972
29	VIRGINIA POLY INST	Schwartz, E.	HQ-XE	Laporte, J. E.	NGT 00-050-489	6241
31	ALABAMA A&M UNIV	Fox, K.	HQ-EL	Tan, A.	NAGW 1067	1016
31	ARIZONA STATE UNIV	Underwood, J. R.	HQ-EL	Greeley, R.	NSG 7548	1280
31	AUBURN UNIV-AUBURN	Moore, R. L.	MSFC	Hinata, S.	NAS 8-35057	1037
31	AUBURN UNIV-AUBURN	Parr, R. A.	MSFC	Crocker, M. J.	NAS 8-36654	1041
31	AUBURN UNIV-AUBURN	Gentz, S. J.	MSFC	Wilcox, R. C.	NAS 8-38184	1044
31	BENNINGTON COL VT	Hall, F.	GSFC	Woods, K. D.	NAG 5-992	5957
31	BOSTON UNIVERSITY	Reasoner, D. L.	MSFC	Mendillo, M.	NAS 8-36324	3655
31	CALIF INST OF TECH	Wales, R. O.	GSFC	Stone, E. C.	NAG 5-727	1502
31	CALIF INST OF TECH	Comberiate, M.	GSFC	Zirin, H.	NAS 5-27269	1557
31	CALIF INST OF TECH	Rummel, J. D.	HQ-EB	Yung, Y. L.	NAGW 1538	1551
31	CALIF INST OF TECH	Jackman, C. H.	HQ-EE	Yung, Y. L.	NAGW 413	1533
31	CALIF INST OF TECH	Bergstrahl, J. T.	HQ-EL	Ingersoll, A. P.	NAGW 58	1530
31	CALIF INST OF TECH	Fix, K.	HQ-EL	Yung, Y. L.	NSG 7376	1585
31	CAL STATE U-FULLERTN	Brinton, H. C.	HQ-EL	Ryan, J. A.	NSG 7614	1604
31	CLARKSON UNIVERSITY	Miller, T. L.	HQ-EE	Tung, K. K.	NAGW 910	4445
31	COLORADO STATE UNIV	Koch, S. E.	GSFC	Pielke, R. A.	NAG 5-359	2386
31	COLORADO STATE UNIV	King, M. D.	GSFC	Randall, D.	NAG 5-1058	2388
31	COLORADO STATE UNIV	Lau, W. K.	GSFC	Stevens, D. E.	NAG 5-1122	2389
31	COLORADO STATE UNIV	McDougal, D. S.	LARC	Cox, S. K.	NAG 1-554	2377
31	COLORADO STATE UNIV	Smith, G. L.	LARC	Haar, T. H.	NAG 1-865	2378
31	COLORADO STATE UNIV	Owens, T. L.	LARC	Randall, D. A.	NAG 1-893	2379
31	COLORADO STATE UNIV	Keynton, R. J.	LARC	Vonder Haar, T. H.	NAG 1-1025	2381
31	COLORADO STATE UNIV	Hall, J. B.	LARC	Vonderhaar, T. H.	NAS 1-16465	2394
31	COLORADO STATE UNIV	Spencer, R. W.	MSFC	Bringe, V. N.	NAG 8-643	2390
31	COLORADO STATE UNIV	Owens, F. C.	HQ-XE	Pielke, R. A.	NGT 00-070-153	2401
31	COLUMBIA UNIVERSITY	Welker, J. E.	GSFC	Kastens, K. A.	NAG 5-1082	4468
31	COLUMBIA UNIVERSITY	Travis, L. D.	GSFC	Broecker, W. S.	NCC 5-29	4498
31	COLUMBIA UNIVERSITY	Stothers, R.	GSFC	Chu, C. K.	NCC 5-34	4500
31	COLUMBIA UNIVERSITY	Travis, L.	GSFC	Levenson, R. L.	NCC 5-36	4501
31	COLUMBIA UNIVERSITY	McDougal, D. S.	LARC	Kukla, G.	NAG 1-653	4454
31	COLUMBIA UNIVERSITY	Kurylo, M. J.	HQ-EE	Broecker, W. S.	NAGW 895	4486
31	CORNELL UNIVERSITY	Conrath, B. J.	GSFC	Rosborough, G. W.	NAG 5-813	4526
31	CORNELL UNIVERSITY	Soffen, G.	GSFC	Brutsaert, W. H.	NAS 5-33004	4566
31	CORNELL UNIVERSITY	Stone, J. F.	MSFC	Kelley, M.	NAS 8-36687	4567
31	CORNELL UNIVERSITY	Bergstrahl, J. T.	HQ-EL	Gierasch, P. J.	NGL 33-010-186	4571
31	CORNELL UNIVERSITY	Bergstrahl, J. T.	HQ-EL	Sagan, C.	NGR 33-010-082	4572
31	DREXEL UNIVERSITY	Bendura, R. J.	LARC	Bandy, A. R.	NAG 1-926	5247
31	DREXEL UNIVERSITY	Drewry, J. W.	LARC	Thornton, D. C.	NAG 1-927	5248
31	DREXEL UNIVERSITY	Cooper, J. E.	LARC	House, F. B.	NAS 1-18154	5253
31	DREXEL UNIVERSITY	Robertson, F.	MSFC	Perkey, D. J.	NAG 8-687	5250
31	DREXEL UNIVERSITY	Robertson, F.	MSFC	Perkey, D. J.	NAG 8-714	5251
31	DREXEL UNIVERSITY	Kurylo, M. J.	HQ-EE	Perkey, D. J.	NAGW 737	5252
31	DUKE UNIVERSITY	Kurylo, M. J.	HQ-EE	Delucia, F. C.	NAGW 1673	4761
31	DUKE UNIVERSITY	Kurylo, M. J.	HQ-EE	Delucia, F. C.	NSG 7540	4768
31	EMORY UNIVERSITY	Bergstrahl, J. T.	HQ-EL	Lin, M. C.	NAGW 1544	2836
31	FLORIDA ATLANTIC U	Margitan, J. J.	HQ-EE	Burnett, C. R.	NAGW 989	2723
31	FLORIDA STATE UNIV	Helfand, M.	GSFC	Pfeffer, R. L.	NAG 5-815	2735
31	FLORIDA STATE UNIV	Nicholson, J. R.	KSC	Fuelberg, H. E.	NAG10-47	2748
31	FLORIDA STATE UNIV	Greene, W. M.	MSFC	Fuelberg, H. E.	NAG 8-33	2739
31	FLORIDA STATE UNIV	Robertson, F. R.	MSFC	Ray, P.	NAG 8-631	2740

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31	FLORIDA STATE UNIV	Christain, H. J.	MSFC	Fuelberg, H.	NAG 8-653	2741
31	FLORIDA STATE UNIV	Miller, T. L.	MSFC	Barcilon, A.	NAG 8-760	2742
31	FLORIDA STATE UNIV	Fitzjarrald, D.	MSFC	Krishnamurti, T. N.	NAG 8-761	2743
31	FLORIDA STATE UNIV	Dodge, J. C.	HQ-EE	Smith, E. A.	NAGW 991	2745
31	FLORIDA STATE UNIV	Owens, F. C.	HQ-XE	Fuelberg, H. E.	NGT 00-050-524	2754
31	FLORIDA STATE UNIV	Owens, F. C.	HQ-XE	Nicholson, S. E.	NGT 00-070-062	2755
31	GEORGE WASHINGTON U	Curran, R. J.	HQ-EE	Dressler, R. F.	NAGW 720	2669
31	GEORGIA INST OF TECH	Reber, C.	GSFC	Cunnold, D.	NAS 5-27264	2885
31	GEORGIA INST OF TECH	Browell, E. V.	LARC	Davis, D. D.	NAG 1-50	2838
31	GEORGIA INST OF TECH	Reichle, H. G., Jr.	LARC	Chameides, W. J.	NAG 1-786	2848
31	GEORGIA INST OF TECH	Browell, E. V.	LARC	Bradshaw, J. D.	NAG 1-818	2849
31	GEORGIA INST OF TECH	McMaster, L. R.	LARC	Grams, G. W.	NAS 1-16356	2882
31	GEORGIA INST OF TECH	Maddrea, G. L.	LARC	Grams, G. W.	NAS 1-18447	2883
31	GEORGIA INST OF TECH	Maddrea, G. L.	LARC	Cunnold, D. M.	NAS 1-18487	2884
31	GEORGIA INST OF TECH	Hoell, J. M.	LARC	Davis, D.	NCC 1-133	2891
31	GEORGIA INST OF TECH	Spencer, R.	MSFC	Gagliano, J.	NAS 8-37142	2886
31	GEORGIA INST OF TECH	McPeters, R. D.	HQ-EE	Alyea, F. N.	NAGW 729	2877
31	GEORGIA INST OF TECH	Kurylo, M. J.	HQ-EE	Wine, P. H.	NAGW 1001	2878
31	GEORGIA INST OF TECH	Bergstralh, J. T.	HQ-EL	Steffes, P. G.	NAGW 533	2876
31	GEORGIA INST OF TECH	Owens, F. C.	HQ-XE	Chameides, W. L.	NGT 00-070-047	2902
31	GEORGIA INST OF TECH	Owens, F. C.	HQ-XE	Davis, D.	NGT 00-070-061	2903
31	HAMPTON UNIVERSITY	Stassinopoulas, E. G., III	GSFC	Venable, D. D.	NAG 5-929	6015
31	HARVARD UNIVERSITY	Condon, E. P.	ARC	Anderson, J. G.	NAG 2-526	3668
31	HARVARD UNIVERSITY	Prather, M.	GSFC	McElroy, M. B.	NAG 5-719	3671
31	HARVARD UNIVERSITY	Fishman, J.	LARC	McElroy, M. B.	NAG 1-55	3666
31	HARVARD UNIVERSITY	Jackman, C. H.	HQ-EE	McElroy, M. B.	NAGW 359	3680
31	HARVARD UNIVERSITY	McPeters, R. D.	HQ-EE	Wofsy, S. C.	NAGW 1230	3685
31	HARVARD UNIVERSITY	Kurylo, M. J.	HQ-EE	Anderson, J. G.	NAGW 1464	3689
31	HARVARD UNIVERSITY	Margitan, J. J.	HQ-EE	Anderson, J. G.	NASW 3960	3696
31	HARVARD UNIVERSITY	Fox, K.	HQ-EL	McElroy, G. B.	NAGW 417	3681
31	HARVARD UNIVERSITY	Fox, K.	HQ-EL	Goody, R. M.	NAGW 1384	3687
31	HARVARD UNIVERSITY	Bergstralh, J. T.	HQ-EL	Parkinson, W. H.	NAGW 1400	3688
31	HARVARD UNIVERSITY	Fox, K.	HQ-EL	Goody, R. M.	NGL 22-007-228	3701
31	HARVARD UNIVERSITY	Clayton, G. C.	HQ-EZ	Parkinson, W. H.	NAGW 1596	3690
31	HARVARD UNIVERSITY	Clayton, G. C.	HQ-EZ	Kirshner, R.	NAGW 1789	3694
31	HARVARD UNIVERSITY	Owens, F. C.	HQ-XE	McElroy, M. B.	NGT 00-050-537	3711
31	HOWARD UNIVERSITY	Alterescu, S.	GSFC	Thorpe, A. N.	NAG 5-1017	2695
31	HOWARD UNIVERSITY	Bergstralh, J. T.	HQ-EL	Okabe, H.	NAGW 785	2699
31	INDIANA U-BLOOMINGTN	Kurylo, M. J.	HQ-EE	Reilly, J. P.	NAGW 1670	3182
31	IOWA STATE UNIV	Pfaendtnr, J. W.	GSFC	Chen, T. C.	NAG 5-355	3270
31	IOWA STATE UNIV	Wu, M. L.	GSFC	Stanford, J. L.	NAG 5-1060	3272
31	JOHNS HOPKINS UNIV	Schoeberl, M. R.	GSFC	Strobel, D. F.	NAG 5-796	3453
31	JOHNS HOPKINS UNIV	Smith, M. A.	HQ-EE	Strobel, D. F.	NAGW 826	3469
31	JOHNS HOPKINS UNIV	Bergstralh, J. T.	HQ-EL	Strobel, D. F.	NAGW 648	3466
31	KANSAS STATE UNIV	Hall, F. G.	GSFC	Kirkham, M. B.	NAG 5-389	3347
31	MASS INST OF TECH	Valero, F. P.	ARC	Newell, R. E.	NCA 2-327	3850
31	MASS INST OF TECH	Shiue, J. C.	GSFC	Staelin, D. H.	NAG 5-10	3751
31	MASS INST OF TECH	Genio, A. D.	GSFC	Eagleson, P. S.	NAG 5-743	3761
31	MASS INST OF TECH	Atlas, R.	GSFC	Dole, R. M.	NAG 5-927	3766
31	MASS INST OF TECH	Helfand, C. M.	GSFC	Lindzen, R. S.	NAG 5-1061	3769
31	MASS INST OF TECH	Welker, J. E.	GSFC	McNutt, M.	NAG 5-1084	3770
31	MASS INST OF TECH	Rood, R. B.	GSFC	Plumb, R. A.	NAG 5-1102	3771
31	MASS INST OF TECH	Duffy, D.	GSFC	Stone, P. H.	NGR 22-009-727	3861
31	MASS INST OF TECH	Rind, D.	GSFC	Stone, P. H.	NSG 5113	3881
31	MASS INST OF TECH	Rosendhal, J. D.	HQ-E	Fegley, B.	NAGW 821	3801
31	MASS INST OF TECH	Jackman, C. H.	HQ-EE	Prinn, R. G.	NAGW 474	3794
31	MASS INST OF TECH	Kakar, R. K.	HQ-EE	Lindzen, R. S.	NAGW 525	3795
31	MASS INST OF TECH	Jackman, C. H.	HQ-EE	Newell, R. E.	NAGW 703	3797
31	MASS INST OF TECH	McPeters, R. D.	HQ-EE	Prinn, R. G.	NAGW 732	3799
31	MASS INST OF TECH	Kurylo, M. J.	HQ-EE	Steinfeld, J. I.	NAGW 1667	3824

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31	MASS INST OF TECH	McPeters, R. D.	HQ-EE	Plumb, R. A.	NAGW 1727	3827
31	MASS INST OF TECH	Fox, K.	HQ-EL	Fegley, B.	NAGW 997	3803
31	MCGILL UNIVERSITY	Keynton, R. J.	LARC	Davies, R.	NAGW 1466	6485
31	MONTANA STATE UNIV	Vargas, J.	MSFC	Tsuruta, S.	NAG 8-783	4229
31	NEW MEX INST MINING	Christian, H. J.	MSFC	Jones, J. J.	NAG 8-751	4378
31	NEW YORK UNIVERSITY	Suarey, M.	GSFC	Isaacson, E.	NAG 5-341	4604
31	NEW YORK UNIVERSITY	Pfaendtner, J.	GSFC	Cohn, S.	NAG 5-820	4605
31	NEW YORK UNIVERSITY	Peslen, C. A.	GSFC	Takano, K.	NAG 5-1033	4606
31	NEW YORK UNIVERSITY	Helfand, M.	GSFC	Takamo, K.	NAG 5-1238	4607
31	NO CAROLINA STATE U	Jedlorek, G.	MSFC	Anderson, D. E.	NAS 8-38135	4805
31	OHIO STATE UNIV	Kurylo, M. J.	HQ-EE	Shaw, J. H.	NAGW 1129	5048
31	OREGON GRADUATE CTR	Kurylo, M. J.	HQ-EE	Rasmussen, R. A.	NAGW 1348	5189
31	OREGON STATE UNIV	Pollack, J. B.	ARC	Barnes, J. R.	NCA 2-205	5207
31	OREGON STATE UNIV	Soffen, G.	GSFC	Abbott, M.	NAS 5-30553	5206
31	OREGON STATE UNIV	McDougal, D. S.	LARC	Coakley, J. A.	NAG 1-935	5191
31	OREGON STATE UNIV	Cooper, J. E.	LARC	Coakley, J. A.	NAS 1-18992	5205
31	OREGON STATE UNIV	Bergstralh, J. T.	HQ-EL	Barnes, J. R.	NAGW 1127	5197
31	OREGON STATE UNIV	Owens, F. C.	HQ-XE	Barnes, J. R.	NGT 00-050-167	5209
31	PENN STATE U-UNIV PK	Toon, O. B.	ARC	Carlson, T. N.	NCC 2-489	5356
31	PENN STATE U-UNIV PK	Susskind, J.	GSFC	Herman, R. H.	NAG 5-303	5307
31	PENN STATE U-UNIV PK	Parsons, C. L.	GSFC	Olivero, J. J.	NAG 5-654	5312
31	PENN STATE U-UNIV PK	Rind, D.	GSFC	Crane, R. G.	NAG 5-1133	5318
31	PENN STATE U-UNIV PK	McDougal, D. S.	LARC	Fairall, C. W.	NAG 1-652	5277
31	PENN STATE U-UNIV PK	McDougal, D. S.	LARC	Ackerman, T. P.	NAG 1-999	5285
31	PENN STATE U-UNIV PK	Hoell, J. M.	LARC	Brune, W. H.	NAG 1-1057	5288
31	PENN STATE U-UNIV PK	Carlson, C. A.	MSFC	Forbes, G. S.	NAG 8-754	5324
31	PENN STATE U-UNIV PK	Kaufman, J. W.	MSFC	Clark, J.	NAG 8-780	5327
31	PENN STATE U-UNIV PK	Dodge, J. C.	HQ-EE	Warner, T. T.	NAGW 994	5329
31	PENN STATE U-UNIV PK	Kurylo, M. J.	HQ-EE	Olivero, J.	NAGW 1302	5332
31	PENN STATE U-UNIV PK	Kakar, R. K.	HQ-EE	Dutton, J. A.	NAGW 1434	5336
31	PENN STATE U-UNIV PK	Kurylo, M. J.	HQ-EE	Brune, W. H.	NAGW 1465	5337
31	PORTLAND STATE UNIV	Hoell, J. M.	LARC	O'Brien, R. J.	NAG 1-697	5216
31	PRINCETON UNIVERSITY	Owens, F. C.	HQ-XE	Pierrehumbert, R. T.	NGT 00-050-324	4360
31	PURDUE UNIVERSITY	Curran, R. J.	GSFC	Smith, P. G.	NAG 5-101	3215
31	PURDUE UNIVERSITY	Thiele, O. W.	GSFC	Harshvardhan	NAG 5-1088	3216
31	PURDUE UNIVERSITY	Fraser, R. S.	GSFC	Harshvardhan	NAG 5-1125	3217
31	PURDUE UNIVERSITY	Owens, T. L.	LARC	Smith, P. J.	NAG 1-552	3192
31	PURDUE UNIVERSITY	Robinson, F.	MSFC	Smith, P. J.	NAG 8-764	3219
31	PURDUE UNIVERSITY	Fichtl, G. H.	MSFC	Smith, P. J.	NAS 8-34009	3228
31	PURDUE UNIVERSITY	Kaufman, J.	MSFC	Vincent, D. G.	NAS 8-37127	3229
31	PURDUE UNIVERSITY	Owens, F. C.	HQ-XE	Sun, W. Y.	NGT 00-050-154	3238
31	RICE UNIVERSITY	Taylor, H. A.	GSFC	Cloutier, P.	NAS 5-28764	5602
31	RICE UNIVERSITY	Bergstralh, J. T.	HQ-EL	Chamberlain, J. W.	NSG 7043	5609
31	RICE UNIVERSITY	Bergstralh, J. T.	HQ-EL	Stebbing, R. F.	NSG 7386	5610
31	ST JOHN'S COL MAIN C	Potter, P. Y.	MSFC	Beall, J. H.	NAG 8-625	3501
31	SAN JOSE STATE UNIV	Haberle, R. M.	ARC	Bornstein, R. D.	NCA 2-220	1652
31	SAN JOSE STATE UNIV	Vedder, J. F.	ARC	Goodman, J.	NCC 2-168	1664
31	SAN JOSE STATE UNIV	Chan, K. R.	ARC	Goodman, J.	NCC 2-211	1666
31	SAN JOSE STATE UNIV	Wingrove, R. C.	ARC	Lester, P. F.	NCC 2-315	1668
31	SAN JOSE STATE UNIV	Young, R. E.	ARC	Lester, P.	NCC 2-471	1675
31	SO DAKOTA SCHL MINES	Wu, M. L.	GSFC	Smith, P.	NAG 5-386	5483
31	SO DAKOTA SCHL MINES	Wielicki, B. A.	LARC	Sengupta, S. K.	NAG 1-542	5482
31	SO DAKOTA SCHL MINES	Robertson, F. R.	MSFC	Orville, H.	NAG 8-632	5484
31	SO DAKOTA SCHL MINES	Robertson, F. R.	MSFC	Smith, P.	NAG 8-633	5485
31	SO UNIV & A&M COL-BR	Carter Jr., D. J.	LARC	Scott, R. L.	NAS 1-15335	3417
31	STANFORD UNIVERSITY	Hibbard, W.	GSFC	Banks, P.	NAS 5-30347	1749
31	STANFORD UNIVERSITY	Sisson, J. M.	MSFC	Banks, P.	NAS 8-36812	1754
31	STANFORD UNIVERSITY	Bergstralh, J.	HQ-EL	Eshleman, V. R.	NGL 05-020-014	1833
31	STATE UNIV NY-ALBANY	Wilhelmi, A. J.	ARC	Kritz, M. A.	NAG 2-277	4656
31	STATE UNIV NY-ALBANY	Pfister, L.	ARC	Kritz, M. A.	NCA 2-167	4668

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31	STATE UNIV NY-ALBANY	Wegener, S.	ARC	Kritz, M. A.	NCC 2-502	4673
31	STATE UNIV NY-ALBANY	Danielsen, E. F.	ARC	Kritz, M. A.	NCC 2-530	4674
31	STATE UNIV NY-ALBANY	Niemann, H.	GSFC	Owen, T.	NAS 5-30126	4665
31	STATE UNIV NY-ALBANY	Ritter, J. A.	LARC	Fitzjarald, D. R.	NAG 1-583	4653
31	STATE UNIV NY-ALBANY	Ritter, J. A.	LARC	Fitzjarald, D. R.	NAG 1-692	4654
31	STATE UNIV NY-ALBANY	Ritter, J. A.	LARC	Fitzjarald, D. R.	NAG 1-847	4655
31	STATE UNIV NY-ALBANY	Cooper, J. L.	LARC	Cess, R. D.	NAS 1-18155	4664
31	STATE UNIV NY-ALBANY	Cofer, W. R., III	LARC	Lala, G. G.	NCC 1-102	4669
31	STATE UNIV NY-ALBANY	Ritter, J. A.	LARC	Fitzjarald, D. R.	NCC 1-135	4670
31	STATE UNIV NY-ALBANY	Blakeslee, R. J.	MSFC	Vonnegut, B.	NAG 8-628	4659
31	STATE UNIV NY-ALBANY	Blakeslee, R. J.	MSFC	Orville, R. E.	NAG 8-737	4660
31	STATE UNIV NY-ALBANY	Christian, H. J.	MSFC	Orville, R. E.	NAS 8-33380	4666
31	ST U NY COL-PURCHASE	Helfand, M.	GSFC	Tenenbaum, J.	NSG 5077	4734
31	STATE U NY-STONY BRK	Rood, R. B.	GSFC	Geller, M. A.	NAG 5-1206	4707
31	STATE U NY-STONY BRK	Kurylo, M. J.	HQ-EE	De Zafra, R.	NAGW 353	4712
31	STATE U NY-STONY BRK	Kurylo, M. J.	HQ-EE	Solomon, P. M.	NAGW 1560	4721
31	STATE U NY-STONY BRK	Bergstrahl, J. T.	HQ-EL	Fox, J. L.	NAGW 665	4713
31	STATE U NY-STONY BRK	Fox, K.	HQ-EL	Caldwell, J. J.	NAGW 876	4715
31	STATE U NY-STONY BRK	Bergstrahl, J. T.	HQ-EL	Varanasi, P.	NGR 33-015-139	4725
31	STATE U NY-STONY BRK	Bekey, I.	HQ-Z	Krikorian, A. D.	NASW 4472	4723
31	TEXAS A&M UNIV SYSTM	Kaufman, J. W.	MSFC	McGuirk, J. P.	NAS 8-37284	5624
31	TEXAS A&I UNIVERSITY	Herman, C.	JSC	Linder, J. S.	NAG 9-331	5617
31	TEXAS A&M UNIVERSITY	Lau, W. K.	GSFC	North, G. R.	NAG 5-868	5646
31	TEXAS A&M UNIVERSITY	Bell, T. L.	GSFC	North, G. R.	NAG 5-869	5647
31	TEXAS A&M UNIVERSITY	Smith, G. L.	LARC	Graves, C. E.	NAG 1-1062	5636
31	UNIV ALA-HUNTSVILLE	Reichmann, E. J.	MSFC	Wu, S. T.	NAG 8-53	1094
31	UNIV ALA-HUNTSVILLE	Johnson, D.	MSFC	Hung, R. J.	NAG 8-63	1098
31	UNIV ALA-HUNTSVILLE	Robertson, F. R.	MSFC	Knupp, K. R.	NAG 8-654	1121
31	UNIV ALA-HUNTSVILLE	Lehoczy, S. L.	MSFC	Rosenberger, F. E.	NAG 8-790	1138
31	UNIV ALA-HUNTSVILLE	Roberts, W. T.	MSFC	Wu, S. T.	NAS 8-36102	1157
31	UNIV ALA-HUNTSVILLE	Greene, W. M.	MSFC	McNider, R. T.	NAS 8-36279	1158
31	UNIV ALA-HUNTSVILLE	Arnold, J.	MSFC	McNider, R. T.	NAS 8-36479	1160
31	UNIV ALA-HUNTSVILLE	Hill, H. C.	MSFC	Torr, D. G.	NAS 8-37106	1166
31	UNIV ALA-HUNTSVILLE	Duncan, B.	MSFC	Ston, N.	NAS 8-37107	1167
31	UNIV ALA-HUNTSVILLE	Wilson, G. S.	MSFC	McNider, R. T.	NAS 8-37139	1168
31	UNIV ALA-HUNTSVILLE	Arnold, J.	MSFC	McNider, R. T.	NAS 8-37585	1172
31	UNIV ALA-HUNTSVILLE	Fields, S. A.	MSFC	Torr, D. G.	NAS 8-37586	1173
31	UNIV ALA-HUNTSVILLE	Witherow, W.	MSFC	Caulfield, H. J.	NAS 8-38078	1176
31	UNIV ALA-HUNTSVILLE	Vinas, A. F.	HQ-EE	Wu, S. T.	NAGW 1117	1145
31	UNIV ALA-HUNTSVILLE	Dodge, J. D.	HQ-EE	Hung, R. J.	NAGW 1165	1146
31	UNIV ALASKA-FAIRBNKS	Milliner, C. F.	GSFC	Brown, N. B.	NAS 5-28971	1219
31	UNIV ALASKA-FAIRBNKS	Malone, M. F.	MSFC	Wescott, E. M.	NAS 8-36321	1220
31	UNIV ALASKA-FAIRBNKS	Johnson, D. L.	MSFC	Fritts, D. C.	NAS 8-37591	1221
31	UNIV ALASKA-FAIRBNKS	Miller, T. L.	HQ-EE	Fritts, D. C.	NAGW 1174	1210
31	UNIV OF ARIZONA	Twarowski, R. J.	ARC	Tomasko, M. G.	NAG 2-416	1295
31	UNIV OF ARIZONA	Niemann, H.	GSFC	Hunten, D.	NAS 5-30124	1421
31	UNIV OF ARIZONA	Wesenberg, R. P.	KSC	Krider, E. P.	NAS10-11390	1430
31	UNIV OF ARIZONA	Fitzjarald, D. E.	MSFC	Schotland, R. M.	NAG 8-766	1338
31	UNIV OF ARIZONA	Kaufman, J. W.	MSFC	Gall, R. L.	NAS 8-36278	1423
31	UNIV OF ARIZONA	McPeters, R. D.	HQ-EE	Hood, L. L.	NAGW 909	1364
31	UNIV OF ARIZONA	Bergstrahl, J. T.	HQ-EL	Lewis, J. S.	NAGW 340	1347
31	UNIV OF ARIZONA	Fox, K.	HQ-EL	Kumar, S.	NAGW 500	1349
31	UNIV OF ARIZONA	Bergstrahl, J. T.	HQ-EL	Broadfoot, A. L.	NAGW 610	1354
31	UNIV OF ARIZONA	Brinton, H. C.	HQ-EL	Wisniewski, W. Z.	NAGW 716	1357
31	UNIV OF ARIZONA	Bergstrahl, J.	HQ-EL	Shemansky, D. E.	NAGW 744	1358
31	UNIV OF ARIZONA	Bergstrahl, J. T.	HQ-EL	Lunine, J. I.	NAGW 1039	1370
31	UNIV OF ARIZONA	Quaide, W. L.	HQ-EL	Tomasko, M. G.	NAGW 1329	1392
31	UNIV OF ARIZONA	Bergstrahl, J. T.	HQ-EL	Hunten, D. M.	NSG 7558	1479
31	UNIV OF ARIZONA	Bergstrahl, J. T.	HQ-EL	Tomasko, M. G.	NSG 7573	1480
31	UNIV ARKANSAS-FAYETV	Ragent, B.	ARC	Mazumder, M. K.	NAG 2-147	1486

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31	UNIV ARKANSAS-LTL RK	Owens, F. C.	HQ-LE	Mazumder, M. K.	NGT 00-070-013	1492
31	UNIV CALIF-BERKELEY	Wales, R. O.	GSFC	Mozer, F. S.	NAG 5-375	1876
31	UNIV CALIF-BERKELEY	Wales, R. O.	GSFC	Anderson, K. A.	NAG 5-376	1877
31	UNIV CALIF-BERKELEY	Harwell, R.	MSFC	Bowyer, S.	NAS 8-32577	1934
31	UNIV CALIF-BERKELEY	Reichmann, E. J.	MSFC	Lin, R. P.	NAS 8-37687	1935
31	UNIV CALIF-DAVIS	Bergstralh, J. T.	HQ-EL	Jackson, W. M.	NAGW 903	2013
31	UNIV CALIF-IRVINE	Hoell, J. M.	LARC	Rowland, F. S.	NAG 1-783	2043
31	UNIV CALIF-IRVINE	Kurylo, M. J.	HQ-EE	Rowland, F. S.	NAGW 452	2050
31	UNIV CALIF-L ANGELES	Toon, O. B.	ARC	Turco, R. P.	NCA 2-377	2140
31	UNIV CALIF-L ANGELES	Pfaendtnr, J.	GSFC	Ghil, M.	NAG 5-713	2077
31	UNIV CALIF-L ANGELES	Suarez, M.	GSFC	Arakawa, A.	NAG 5-789	2078
31	UNIV CALIF-L ANGELES	Wales, R. O.	GSFC	Russell, C. T.	NAS 5-28448	2129
31	UNIV CALIF-L ANGELES	Chappell, C. R.	MSFC	Abdella, M. A.	NAG 8-74	2089
31	UNIV CALIF-L ANGELES	McPeters, R. D.	HQ-EE	Mechoso, C. R.	NAGW 1021	2106
31	UNIV CALIF-L ANGELES	Curran, R. J.	HQ-EE	Wurtele, M. G.	NAGW 1044	2107
31	UNIV CALIF-L ANGELES	Bergstralh, J. T.	HQ-EL	Siscoe, G. L.	NAGW 87	2098
31	UNIV CALIF-L ANGELES	Bergstralh, J. T.	HQ-EL	Russell, C. T.	NAGW 717	2102
31	UNIV CALIF-L ANGELES	Brinton, H. C.	HQ-EL	Kennel, C. F.	NAGW 968	2104
31	UNIV CALIF-L ANGELES	Bergstralh, J. T.	HQ-EL	Schubert, G.	NSG 7164	2162
31	UNIV CALIF-SAN DIEGO	Wegener, S. S.	ARC	Weiss, R. F.	NAG 2-586	2174
31	UNIV CALIF-SAN DIEGO	Suarez, M.	GSFC	Somerville, R. C.	NAG 5-236	2177
31	UNIV CALIF-SAN DIEGO	Whitlock, C. H.	LARC	Gautier, C.	NAG 1-889	2168
31	UNIV CALIF-SAN DIEGO	Butler, D. M.	HQ-EE	Gautier, C. H.	NAGW 1141	2218
31	UNIV CALIF-SAN DIEGO	Kaluzienski, L. J.	HQ-EZ	Peterson, L. E.	NAGW 1837	2229
31	UNIV OF CHICAGO	Hilsenrath, E.	GSFC	Frederick, J. E.	NAG 5-873	3027
31	UNIV OF CHICAGO	Chou, M. D.	GSFC	Donner, L. J.	NAG 5-1056	3029
31	UNIV OF CHICAGO	Sullivan, E. M.	LARC	Frederick, J. E.	NAS 1-18239	3060
31	UNIV OF CHICAGO	Barkstrom, B. . .	LARC	Ramanathan, V.	NAS 1-18385	3061
31	UNIV OF CHICAGO	Jackman, C. H.	HQ-EE	Tiao, G. C.	NAGW 762	3042
31	UNIV OF CHICAGO	Miller, T. L.	HQ-EE	Frederick, J. E.	NAGW 873	3044
31	UNIV OF CHICAGO	Dodge, J. C.	HQ-EE	Fujita, T. T.	NGR 14-001-008	3071
31	UNIV OF CHICAGO	Evans, L. G.	HQ-EL	Turkevich, A.	NAGW 878	3045
31	UNIV OF CHICAGO	Gold, R.	HQ-EL	Simpson, J. A.	NASW 4196	3065
31	UNIV OF CHICAGO	Jones, W. V.	HQ-EZ	Muller, D.	NSG 7464	3093
31	UNIV COLORADO-BOLDR	Cahalan, R. F.	GSFC	Barry, R. G.	NAG 5-898	2436
31	UNIV COLORADO-BOLDR	Melfi, S. H.	GSFC	Grossman, R. L.	NAG 5-1115	2447
31	UNIV COLORADO-BOLDR	Rouzer, L.	GSFC	London, J.	NAS 5-27263	2515
31	UNIV COLORADO-BOLDR	Piterski, N.	GSFC	Rottman, G.	NAS 5-27750	2516
31	UNIV COLORADO-BOLDR	Mc peters, R.	GSFC	London, J.	NSG 5153	2564
31	UNIV COLORADO-BOLDR	McDougal, D. S.	LARC	Hanson, H. P.	NAG 1-651	2404
31	UNIV COLORADO-BOLDR	McDougal, D. M.	LARC	London, J.	NAG 1-998	2409
31	UNIV COLORADO-BOLDR	Kaufman, J. W.	MSFC	Salby, M. L.	NAG 8-787	2463
31	UNIV COLORADO-BOLDR	Hall, G.	MSFC	Hart, J. E.	NAS 8-31958	2527
31	UNIV COLORADO-BOLDR	McPeters, R. D.	HQ-EE	Salby, M. L.	NAGW 772	2472
31	UNIV COLORADO-BOLDR	Jackman, C. H.	HQ-EE	Thomas, R. J.	NAGW 890	2474
31	UNIV COLORADO-BOLDR	Miller, T. L.	HQ-EE	Rusch, D. W.	NAGW 904	2475
31	UNIV COLORADO-BOLDR	McPeters, R. D.	HQ-EE	Grossman, R. L.	NAGW 934	2476
31	UNIV COLORADO-BOLDR	Schiffer, R. A.	HQ-EE	London, J.	NAGW 1002	2479
31	UNIV COLORADO-BOLDR	Butler, D. M.	HQ-EE	Salby, M.	NAGW 1138	2486
31	UNIV COLORADO-BOLDR	McPeters, R. D.	HQ-EE	Rusch, D. W.	NAGW 1742	2510
31	UNIV COLORADO-BOLDR	McPeters, R. D.	HQ-EE	Fesen, C. G.	NAGW 1758	2512
31	UNIV COLORADO-BOLDR	Esenwein, G.	HQ-EE	Barth, C.	NASW 4091	2530
31	UNIV COLORADO-BOLDR	Fox, K.	HQ-EL	Hord, C. W.	NAGW 197	2465
31	UNIV COLORADO-BOLDR	Fox, K.	HQ-EL	Esposito, L.	NAGW 389	2466
31	UNIV COLORADO-BOLDR	Bergstralh, J. T.	HQ-EL	Jakosky, B. M.	NAGW 552	2467
31	UNIV COLORADO-BOLDR	Bergstralh, J. T.	HQ-EL	Clancy, R. T.	NAGW 1228	2492
31	UNIV COLORADO-BOLDR	Mahaffy, P.	HQ-EL	Esposito, L. W.	NAGW 1263	2493
31	UNIV COLORADO-BOLDR	Owens, F. C.	HQ-LE	Bohannon, B.	NGT 00-070-005	2560
31	UNIV OF DAYTON	Schmidlin, F. J.	GSFC	Luers, J. K.	NAS 5-28297	5140
31	UNIV OF DENVER	Vedder, J. F.	ARC	Murcray, D. G.	NAG 2-351	2574

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31	UNIV OF DENVER	Wegener, S. S.	ARC	Wilson, J. C.	NAG 2-458	2575
31	UNIV OF DENVER	Wegener, S. S.	ARC	Wilson, J. C.	NCC 2-470	2579
31	UNIV OF DENVER	McMaster, L. R.	LARC	Murcray, D. G.	NAS 1-16306	2576
31	UNIV OF DENVER	Ringland, C. P.	LARC	Goldman, A.	NCC 1-48	2578
31	UNIV DIST COLUMBIA	Kyle, H. L.	GSFC	Ohuria, H.	NAG 5-1012	2708
31	UNIV OF FLORIDA	Wilhelmi, A. J.	ARC	Lanzerotti, L. J.	NAS 2-9976	2790
31	UNIV OF FLORIDA	Jafferis, W.	KSC	Thomson, E. M.	NAG10-49	2789
31	UNIV OF FLORIDA	Dodge, J. C.	HQ-EE	Uman, M. A.	NAGW 1153	2782
31	UNIV OF GEORGIA	Hall, F. G.	GSFC	Kanemasu, E.	NAG 5-1192	2917
31	UNIV OF HAWAII-MANOA	Fitzjarrald, D. E.	MSFC	Clarke, A. D.	NAG 8-634	2934
31	UNIV HOUSTON-HOUSTON	Robbins, D. E.	JSC	Sheldon, W. R.	NAG 9-213	5719
31	UNIV OF IDAHO	Bendura, R. J.	LARC	Farwell, S. O.	NAG 1-923	2982
31	UNIV ILLINOIS-URBANA	Kaufman, J. W.	MSFC	Actemeir, G. L.	NAG 8-59	3130
31	UNIV ILLINOIS-URBANA	Jackman, C. H.	HQ-EE	Bowman, K. P.	NAGW 992	3132
31	UNIV ILLINOIS-URBANA	McPeters, R. D.	HQ-EE	Robinson, W. A.	NAGW 1729	3138
31	UNIV OF IOWA	Bell, T.	GSFC	Krajewski, W. F.	NAG 5-1126	3302
31	UNIV OF IOWA	Wales, R. O.	GSFC	Frank, L.	NAS 5-28700	3333
31	UNIV OF IOWA	Wales, R. O.	GSFC	Gurnett, D. A.	NAS 5-28701	3334
31	UNIV OF IOWA	Ritter, J. A.	LARC	Carmichael, G. R.	NCC 1-97	3339
31	UNIV OF IOWA	Miller, T. L.	MSFC	Nathan, T. R.	NAG 8-635	3305
31	UNIV OF IOWA	Parks, G. K.	HQ-ES	Van Allen, J. A.	NAGW 1739	3326
31	UNIV OF KENTUCKY	Reichle, H. G.	LARC	Peters, L. K.	NAG 1-707	3385
31	UNIV MARYLAND-BALT	Kurylo, M. J.	HQ-EE	Strow, L. L.	NAGW 1020	3506
31	UNIV MARYLAND-COL PK	Fraser, R. S.	GSFC	Pinker, R. T.	NAG 5-203	3521
31	UNIV MARYLAND-COL PK	Susskind, J.	GSFC	Thompson, O. E.	NAG 5-730	3533
31	UNIV MARYLAND-COL PK	Spinhirne, J. D.	GSFC	Pinker, R. T.	NAG 5-731	3534
31	UNIV MARYLAND-COL PK	Thiele, O. W.	GSFC	Baer, F.	NAG 5-783	3536
31	UNIV MARYLAND-COL PK	Sud, Y.	GSFC	Baer, F. E.	NAG 5-866	3537
31	UNIV MARYLAND-COL PK	Peslen, C. A.	GSFC	Baer, F. E.	NAG 5-867	3538
31	UNIV MARYLAND-COL PK	Chou, M. D.	GSFC	Pinker, R. T.	NAG 5-914	3542
31	UNIV MARYLAND-COL PK	Schubert, S.	GSFC	Straus, D.	NAG 5-1094	3555
31	UNIV MARYLAND-COL PK	Sullivan, R. J.	GSFC	Wilkerson, T. D.	NAG 5-1114	3557
31	UNIV MARYLAND-COL PK	Kreins, E. R.	GSFC	Baer, F.	NAS 5-29163	3593
31	UNIV MARYLAND-COL PK	Kreins, E.	GSFC	Baer, F.	NAS 5-30108	3594
31	UNIV MARYLAND-COL PK	Stich, K.	GSFC	Gloeckler, G.	NAS 5-30385	3596
31	UNIV MARYLAND-COL PK	Middleton, E. M.	GSFC	Goward, S. N.	NCC 5-26	3610
31	UNIV MARYLAND-COL PK	Kreins, E. R.	GSFC	Baer, F.	NCC 5-39	3612
31	UNIV MARYLAND-COL PK	Kostiuk, T.	GSFC	Trasco, J.	NGL 21-002-033	3614
31	UNIV MARYLAND-COL PK	Browell, E. V.	LARC	Wilkerson, T. D.	NCC 1-25	3606
31	UNIV MARYLAND-COL PK	Schiffer, R. A.	HQ-EE	Shukla, J.	NAGW 557	3570
31	UNIV MARYLAND-COL PK	Kakar, R. K.	HQ-EE	Shukla, J.	NAGW 558	3571
31	UNIV MARYLAND-COL PK	Kakar, R. K.	HQ-EE	Shukla, J.	NAGW 1166	3581
31	UNIV MARYLAND-COL PK	Huntress, W., Jr.	HQ-EE	Ellingson, R. G.	NAGW 1471	3585
31	UNIV MARYLAND-COL PK	Bergstralh, J. T.	HQ-EL	Khanna, R. K.	NAGW 637	3572
31	UNIV MARYLAND-COL PK	Bergstralh, J. T.	HQ-EL	Papadopoulos, D.	NAGW 1037	3578
31	UNIV MARYLAND-COL PK	Evans, L. G.	HQ-EL	Hamilton, D. C.	NASW 4221	3601
31	UNIV MARYLAND-COL PK	Mellott, M.	HQ-ES	Drake, J. F.	NAGW 1661	3589
31	UNIV OF MASS-AMHERST	Connor, B. J.	LARC	Parrish, A. D.	NAG 1-1022	3899
31	UNIV OF MIAMI	Drewry, J. W.	LARC	Saltzman, E. S.	NAG 1-918	2803
31	UNIV OF MIAMI	Fitzjarrald, D. E.	MSFC	Prospero, J. M.	NAG 8-621	2806
31	UNIV MICH-ANN ARBOR	Brace, L. H.	GSFC	Carignan, G. R.	NAG 5-419	3998
31	UNIV MICH-ANN ARBOR	Spencer, N. W.	GSFC	Carignan, G. R.	NAS 5-25002	4054
31	UNIV MICH-ANN ARBOR	Spencer, N. W.	GSFC	Carignan, G. R.	NAS 5-25031	4055
31	UNIV MICH-ANN ARBOR	Honeycutt, G.	GSFC	Hays, P.	NAS 5-27751	4056
31	UNIV MICH-ANN ARBOR	Way, S.	GSFC	Carignan, G.	NAS 5-29344	4057
31	UNIV MICH-ANN ARBOR	Niemann, B.	GSFC	Atreya, S. K.	NAS 5-30119	4059
31	UNIV MICH-ANN ARBOR	Niemann, H. B.	GSFC	Donahue, T. M.	NAS 5-30120	4060
31	UNIV MICH-ANN ARBOR	Sullivan, E. M.	LARC	Drayson, S. R.	NAS 1-18290	4051
31	UNIV MICH-ANN ARBOR	Duncan, B.	MSFC	Samir, U.	NAS 8-37108	4062
31	UNIV MICH-ANN ARBOR	McPeters, R. D.	HQ-EE	Smith, A. K.	NAGW 1744	4045

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31	UNIV MICH-ANN ARBOR	Fox, K.	HQ-EL	Cravens, T. E.	NAGW 15	4020
31	UNIV MICH-ANN ARBOR	Fox, K.	HQ-EL	Cravens, T. E.	NAGW 312	4023
31	UNIV MICH-ANN ARBOR	Brinton, H. C.	HQ-EL	Nagy, A. F.	NAGW 631	4025
31	UNIV MICH-ANN ARBOR	Bergstralh, J. T.	HQ-EL	Shyn, T.	NAGW 938	4027
31	UNIV MICH-ANN ARBOR	Fox, K.	HQ-EL	Atreya, S. K.	NAGW 990	4028
31	UNIV MICH-ANN ARBOR	Fox, K.	HQ-EL	Atreya, S. K.	NSG 7404	4091
31	UNIV MICH-ANN ARBOR	Mellott, M. M.	HQ-ES	Bishop, J. E.	NAGW 1557	4041
31	UNIV MICH-ANN ARBOR	Owens, F. C.	HQ-XE	Cravens, T.	NGT 00-050-047	4075
31	UNIV MICH-ANN ARBOR	Owens, F. C.	HQ-XE	Atreya, S. K.	NGT 00-050-190	4078
31	UNIV MICH-ANN ARBOR	Owens, F. C.	HQ-XE	Atreya, S. K.	NGT 00-050-201	4080
31	UNIV MICH-ANN ARBOR	Owens, F. C.	HQ-XE	Donahue, T. M.	NGT 00-070-040	4084
31	UNIV MICH-ANN ARBOR	Owens, F. C.	HQ-XE	Gombosi, T. I.	NGT 00-070-096	4085
31	UNIV MICH-ANN ARBOR	Owens, F. C.	HQ-LE	Sharn, W. E.	NGT 00-050-010	4074
31	U MINN-MNPLS-ST PAUL	Klein, B.	GSFC	Kellogg, P.	NAS 5-29313	4122
31	U MINN-MNPLS-ST PAUL	Beswick, A. G.	LARC	Mauersberger, K.	NSG 1431	4139
31	U MINN-MNPLS-ST PAUL	Kurylo, M. J.	HQ-EE	Carr, R. W.	NAGW 800	4116
31	U MINN-MNPLS-ST PAUL	Fox, K.	HQ-EL	Pepin, R. O.	NAGW 1371	4118
31	UNIV MO-ST LOUIS	Bergstralh, J. T.	HQ-EL	James, P. B.	NAGW 1116	4185
31	UNIV NEBRASKA-LINCLN	Fox, K.	HQ-EL	Samson, J. A.	NGR 28-004-021	4251
31	UNIV OF NEVADA-RENO	McKay, C. P.	ARC	Wharton, R. A.	NCA 2-182	4258
31	UNIV NEW HAMP-DURHAM	Lawrence, J. D.	LARC	Crill, P. M.	NAG 1-890	4278
31	UNIV NEW HAMP-DURHAM	Bartlett, D. S.	LARC	Talbot, R. W.	NAG 1-936	4279
31	UNIV NEW HAMP-DURHAM	Lawrence, J. D.	LARC	Crill, P.	NAG 1-938	4280
31	UNIV NEW HAMP-DURHAM	Hoell, J. M.	LARC	Harriss, R. C.	NAG 1-1014	4281
31	UNIV NEW HAMP-DURHAM	Averner, M. M.	HQ-EB	Hines, M. E.	NAGW 512	4289
31	UNIV NEW HAMP-DURHAM	Kurylo, M. J.	HQ-EE	Hariss, R. C.	NAGW 1826	4299
31	UNIV NEW HAMP-DURHAM	Tilford, S. G.	HQ-EE	Moore, E.	NGT 00-080-009	4309
31	UNIV N CAR-CHPL HILL	Bartlett, D. S.	LARC	Martens, C. S.	NAG 1-932	4821
31	UNIV OF NORTH DAKOTA	Bekey, I.	HQ-Z	Rindt, J.	NASW 4455	4842
31	UNIV OKLAHOMA-NORMAN	Whitehead, V.	JSC	Sasaki, Y. K.	NAG 9-228	5187
31	UNIV OREGON-EUGENE	Nolt, I. G.	LARC	Park, K. J.	NAG 1-963	5218
31	UNIV OF OSLO	Callis, L. B.	LARC	Isaksen, I. S.	NAGW 1315	6501
31	UNIV OF PITTSBURGH	Bergstralh, J. T.	HQ-EL	Zipf, E. C.	NGL 39-011-030	5408
31	UNIV OF SOUTHERN CAL	Fox, K.	HQ-EL	Judge, D. L.	NAGW 163	2359
31	UNIV OF SOUTHERN CAL	Bergstralh, J. T.	HQ-EL	Judge, D. L.	NGR 05-018-180	2372
31	UNIV TENNESSEE-KNOXV	Holland, R. L.	MSFC	Reddy, K. C.	NAS 8-36555	5523
31	UNIV TENNESSEE-KNOXV	Jasper, G. L.	MSFC	Frost, W.	NAS 8-37129	5524
31	UNIV TENNESSEE-KNOXV	Kakar, R. K.	HQ-EE	Antar, B. N.	NAGW 863	5519
31	UNIV TENNESSEE-KNOXV	Bergstralh, J. T.	HQ-EL	Fox, K.	NAGW 125	5518
31	UNIV TEXAS-AUSTIN	Owens, F. C.	HQ-XE	Winget, D. E.	NGT 00-050-210	5838
31	UNIV TEXAS-DALLAS	Duntzler, A.	GSFC	Heelis, R. A.	NAS 5-30685	5874
31	UNIV TEXAS-DALLAS	Jones, C. T.	MSFC	Tinsley, B. A.	NAS 8-33827	5875
31	UNIV TEXAS-DALLAS	Fox, K.	HQ-EL	Cunningham, A. J.	NAGW 632	5864
31	UNIV TEXAS-DALLAS	Bergstralh, J. T.	HQ-EL	Johnson, F. S.	NAGW 1665	5870
31	UNIV TEXAS-DALLAS	Fox, K.	HQ-EL	Johnson, F. S.	NGL 44-004-026	5879
31	UNIV TEXAS-DALLAS	Mellott, M. M.	HQ-ES	Hanson, W. B.	NGR 44-004-120	5880
31	UNIV OF UTAH	Helfand, H. M.	GSFC	Paegle, J. N.	NAG 5-127	5932
31	UNIV OF UTAH	Chou, M.	GSFC	Ou, S. S.	NAG 5-732	5933
31	UNIV OF UTAH	Chou, M. D.	GSFC	Liou, K. N.	NAG 5-1050	5934
31	UNIV OF UTAH	Alvarez, J. M.	LARC	Sassen, K.	NAG 1-718	5924
31	UNIV OF UTAH	McDougal, D. S.	LARC	Sassen, K.	NAG 1-868	5925
31	UNIV OF UTAH	Minnis, P.	LARC	Liou, K. N.	NAG 1-1048	5926
31	UNIV OF VIRGINIA	Thiele, O. W.	GSFC	Garstang, M.	NAG 5-870	6116
31	UNIV OF VIRGINIA	Reichle Jr., H. G.	LARC	Garstang, M.	NAG 1-848	6107
31	UNIV OF VIRGINIA	Jones, J. L.	LARC	Singer, S. F.	NAS 1-16550	6135
31	UNIV OF VIRGINIA	Drewry, J. W.	LARC	Garstang, M.	NCC 1-106	6138
31	UNIV OF VIRGINIA	Dodge, J. C.	HQ-EE	Garstang, M.	NAGW 1731	6133
31	UNIV OF VIRGINIA	Bergstralh, J. T.	HQ-EL	Johnson, R. E.	NAGW 461	6125
31	UNIV OF WASHINGTON	Toon, B.	ARC	Hobbs, P. V.	NCA 2-429	6327
31	UNIV OF WASHINGTON	Wales, R. O.	GSFC	Parks, G. K.	NAG 5-373	6263

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31	UNIV OF WASHINGTON	Lau, W. K.	GSFC	Houze, R. A., Jr.	NAG 5-784	6266
31	UNIV OF WASHINGTON	Thiele, O. W.	GSFC	Hobbs, P. V.	NAG 5-886	6267
31	UNIV OF WASHINGTON	Wang, J. R.	GSFC	Katsaros, K. B.	NAG 5-943	6269
31	UNIV OF WASHINGTON	Reber, C.	GSFC	Holton, J. R.	NAS 5-26301	6319
31	UNIV OF WASHINGTON	Brown, I. D.	JSC	Brownlee, D. E.	NSG 9052	6341
31	UNIV OF WASHINGTON	Barrick, J. D.	LARC	Ferek, R. J.	NAG 1-925	6255
31	UNIV OF WASHINGTON	Cooper, J. E.	LARC	Hartmann, D. L.	NAS 1-18157	6318
31	UNIV OF WASHINGTON	Christian, H. J.	MSFC	Baker, M. B.	NAG 8-61	6276
31	UNIV OF WASHINGTON	McPeters, R. D.	HQ-EE	Leovy, C. B.	NAGW 471	6287
31	UNIV OF WASHINGTON	McPeters, R. D.	HQ-EE	Holton, J. R.	NAGW 662	6288
31	UNIV OF WASHINGTON	Margitan, J. J.	HQ-EE	Hartmann, D. L.	NAGW 1160	6300
31	UNIV OF WASHINGTON	McPeters, R. D.	HQ-EE	Tung, K. K.	NAGW 1605	6312
31	UNIV OF WASHINGTON	Dodge, J. C.	HQ-EE	Katsaros, K. B.	NAGW 1688	6313
31	UNIV OF WASHINGTON	Dodge, J. C.	HQ-EE	Brown, R. A.	NAGW 1770	6317
31	UNIV OF WASHINGTON	Bergstralh, J. T.	HQ-EL	Tillman, J. E.	NAGW 1341	6308
31	UNIV OF WASHINGTON	Bergstralh, J. T.	HQ-EL	Leovy, C. B.	NSG 7085	6339
31	UNIV OF WASHINGTON	Owens, F. C.	HQ-XE	Leovy, C. B.	NGT 00-050-231	6330
31	UNIV WISC-MADISON	Adler, R. F.	GSFC	Schlesinger, R. E.	NAG 5-23	6383
31	UNIV WISC-MADISON	Atlas, R. M.	GSFC	Johnson, D. R.	NAG 5-81	6384
31	UNIV WISC-MADISON	Pfaendner, J.	GSFC	Wahba, G.	NAG 5-316	6386
31	UNIV WISC-MADISON	Atlas, R. M.	GSFC	Horn, L. H.	NAG 5-385	6387
31	UNIV WISC-MADISON	Cahalan, R.	GSFC	Weinman, J. A.	NAG 5-580	6388
31	UNIV WISC-MADISON	Heaps, W. S.	GSFC	Roesler, F. L.	NAG 5-745	6392
31	UNIV WISC-MADISON	Thiele, O. W.	GSFC	Martin, D. W.	NAG 5-1113	6399
31	UNIV WISC-MADISON	Arking, A.	GSFC	Smith, W. L.	NAG 5-1117	6400
31	UNIV WISC-MADISON	Whitehead, V.	JSC	Young, J. T.	NAS 9-17642	6443
31	UNIV WISC-MADISON	McDougal, D. S.	LARC	Suomi, V. E.	NAG 1-553	6370
31	UNIV WISC-MADISON	McDougal, D. S.	LARC	Eloranta, E. W.	NAG 1-882	6371
31	UNIV WISC-MADISON	McDougal, D. S.	LARC	Smith, W. L.	NAG 1-1015	6372
31	UNIV WISC-MADISON	Cooper, J. E.	LARC	Smith, W. L.	NAS 1-18272	6428
31	UNIV WISC-MADISON	Miller, T. L.	MSFC	Hitchman, M. H.	NAG 8-786	6407
31	UNIV WISC-MADISON	Christian, H. J.	MSFC	Martin, D.	NAS 8-35981	6437
31	UNIV WISC-MADISON	Greene, W. M.	MSFC	Smith, W. L.	NAS 8-36168	6438
31	UNIV WISC-MADISON	Greene, W. M.	MSFC	Menzel, W. P.	NAS 8-36169	6439
31	UNIV WISC-MADISON	Meyer, P. J.	MSFC	Suomi, V. E.	NAS 8-36292	6440
31	UNIV WISC-MADISON	Green, W. M.	MSFC	Anderson, C. E.	NAS 8-36547	6441
31	UNIV WISC-MADISON	Hood, R. E.	MSFC	Suomi, V. E.	NAS 8-37587	6442
31	UNIV WISC-MADISON	Robertson, F.	MSFC	Diak, G.	NCC 8-11	6447
31	UNIV WISC-MADISON	Robertson, F.	MSFC	Diak, G.	NCC 8-12	6448
31	UNIV WISC-MADISON	Rosendhal, J. D.	HQ-E	Weinman, J. A.	NAGW 872	6413
31	UNIV WISC-MADISON	Jackman, C. H.	HQ-EE	Reinsel, G. C.	NAGW 756	6412
31	UNIV WISC-MADISON	Dodge, J. C.	HQ-EE	Martin, D. W.	NAGW 920	6415
31	UNIV WISC-MADISON	Prather, M. J.	HQ-EE	Hitchman, M. H.	NAGW 1411	6419
31	UNIV WISC-MADISON	Dodge, J. C.	HQ-EE	Menzel, W. P.	NAGW 1745	6422
31	UNIV WISC-MADISON	Dodge, J. C.	HQ-EE	Martin, D. W.	NAGW 1767	6423
31	UNIV WISC-MADISON	Fox, K.	HQ-EL	Limaye, S. S.	NAGW 937	6416
31	UNIV WISC-MADISON	Fox, K.	HQ-EL	Sromov, L. A.	NGR 50-002-189	6449
31	UNIV OF WYOMING	Owens, T. L.	LARC	Hoffman, D. J.	NAS 1-17735	6469
31	UNIV OF WYOMING	Maddrea, G. L.	LARC	Pepin, T.	NAS 1-18495	6470
31	UTAH STATE UNIV	Russell, J. M., III	LARC	Baker, D. J.	NAG 1-899	5939
31	UTAH STATE UNIV	Duncan, B.	MSFC	Stone, N.	NAS 8-37110	5953
31	UTAH STATE UNIV	Bergstralh, J. T.	HQ-EL	Miller, K. L.	NAGW 1556	5947
31	COLLEGE OF WM & MARY	Sullivan, E. M.	LARC	Benner, D. C.	NCC 1-43	5984
31	VIRGINIA POLY INST	Lee, R. B.	LARC	Mahan, J. R.	NAG 1-1016	6197
31	WASHINGTON UNIVERSTY	Browne, I. D.	JSC	Hohenberg, C. M.	NAG 9-7	4192
31	YALE UNIVERSITY	Maier, E. J.	GSFC	Sofia, S.	NAG 5-736	2599
31	YALE UNIVERSITY	Uccellini, L. W.	GSFC	Smith, R. B.	NAG 5-871	2600
31	YALE UNIVERSITY	Kaufman, J. W.	MSFC	Saltzman, B.	NAG 8-785	2602
31	YALE UNIVERSITY	Kaufman, J. W.	MSFC	Saltzman, B.	NAS 8-36356	2607
32	ARIZONA STATE UNIV	Carle, G. C.	ARC	Greeley, R.	NCA 2-362	1270

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32	ARIZONA STATE UNIV	Smith, B. F.	ARC	Greeley, R.	NCC 2-346	1271
32	ARIZONA STATE UNIV	Brown, I. D.	JSC	Buseck, P. R.	NAG 9-59	1248
32	ARIZONA STATE UNIV	Browne, I. D.	JSC	Larimer, J. W.	NAG 9-79	1249
32	ARIZONA STATE UNIV	Browne, I. D.	JSC	Moore, C. B.	NAG 9-183	1250
32	ARIZONA STATE UNIV	Browne, I. D.	JSC	Holloway, J. R.	NAG 9-237	1251
32	ARIZONA STATE UNIV	Rummell, J. D.	HQ-EB	Cronin, J. R.	NSG 7255	1278
32	ARIZONA STATE UNIV	Underwood, J.	HQ-EL	Malin, M. C.	NAGW 1	1252
32	ARIZONA STATE UNIV	Underwood, J.	HQ-EL	Greeley, R.	NAGW 132	1253
32	ARIZONA STATE UNIV	Underwood, J. R.	HQ-EL	Fink, J.	NAGW 529	1254
32	ARIZONA STATE UNIV	Underwood, J.	HQ-EL	Christensen, P. R.	NAGW 943	1256
32	ARIZONA STATE UNIV	Underwood, J. R.	HQ-EL	Greeley, R.	NAGW 1074	1257
32	ARIZONA STATE UNIV	Underwood, J. R.	HQ-EL	Christensen, P. R.	NAGW 1080	1258
32	ARIZONA STATE UNIV	Underwood, J. R.	HQ-EL	Sheridan, M. F.	NAGW 1115	1259
32	ARIZONA STATE UNIV	Underwood, J.	HQ-EL	Greeley, R.	NAGW 1224	1260
32	ARIZONA STATE UNIV	Boyce, J. M.	HQ-EL	Greeley, R.	NAGW 1306	1261
32	ARIZONA STATE UNIV	Underwood, J. R.	HQ-EL	Fink, J.	NAGW 1343	1262
32	ARIZONA STATE UNIV	Underwood, J. R.	HQ-EL	Christensen, P. R.	NAGW 1429	1264
32	ARIZONA STATE UNIV	Underwood, J. R.	HQ-EL	Kieffer, S. W.	NAGW 1740	1267
32	ARIZONA STATE UNIV	Underwood, J. R.	HQ-EL	Greeley, R.	NAGW 1774	1268
32	ARIZONA STATE UNIV	Underwood, J. R.	HQ-EL	Greeley, R.	NSG 7415	1279
32	ARIZONA STATE UNIV	Owens, F. C.	HQ-XE	Holloway, J.	NGT 00-050-301	1273
32	ARIZONA STATE UNIV	Owens, F. C.	HQ-XE	Sheridan, M. F.	NGT 00-050-480	1274
32	ARIZONA STATE UNIV	Owens, F. C.	HQ-XE	Greeley, R.	NGT 00-070-155	1276
32	ARKANSAS COL	Gibson, E.	JSC	Bustin, R.	NAG 9-272	1482
32	BOSTON UNIVERSITY	Browne, I. D.	JSC	Treiman, A. H.	NAG 9-168	3648
32	BROWN UNIVERSITY	Welker, J. E.	GSFC	Pamentier, E. M.	NAG 5-1130	5421
32	BROWN UNIVERSITY	Browne, I. D.	JSC	Pieters, C. M.	NAG 9-184	5423
32	BROWN UNIVERSITY	Browne, I. D.	JSC	Rutherford, M. J.	NAG 9-239	5424
32	BROWN UNIVERSITY	Rosendhal, J. D.	HQ-E	Goettel, K. A.	NAGW 657	5427
32	BROWN UNIVERSITY	Baltuck, M.	HQ-EE	Pieters, C. M.	NAGW 1118	5434
32	BROWN UNIVERSITY	Underwood, J.	HQ-EL	Pieters, C. M.	NAGW 28	5425
32	BROWN UNIVERSITY	Underwood, J. R.	HQ-EL	Head, J. W.	NAGW 137	5426
32	BROWN UNIVERSITY	Underwood, J. R.	HQ-EL	Schultz, P. H.	NAGW 705	5428
32	BROWN UNIVERSITY	Underwood, J. R.	HQ-EL	Head, J. W.	NAGW 713	5429
32	BROWN UNIVERSITY	Underwood, J. R.	HQ-EL	Pieters, C. M.	NAGW 748	5430
32	BROWN UNIVERSITY	Underwood, J. R.	HQ-EL	Schultz, P. H.	NAGW 855	5431
32	BROWN UNIVERSITY	Underwood, J. R.	HQ-EL	Head, J. W.	NAGW 1075	5432
32	BROWN UNIVERSITY	Underwood, J. R.	HQ-EL	Schultz, P. H.	NAGW 1076	5433
32	BROWN UNIVERSITY	Underwood, J.	HQ-EL	Head, J. W.	NGR 40-002-088	5436
32	BROWN UNIVERSITY	Underwood, J.	HQ-EL	Head, J. W.	NGR 40-002-116	5437
32	BROWN UNIVERSITY	Underwood, J. R.	HQ-EL	Head, J. W.	NSG 7570	5445
32	BROWN UNIVERSITY	Boyce, J. M.	HQ-EL	Rutherford, M. J.	NSG 7589	5446
32	BROWN UNIVERSITY	Underwood, J. R.	HQ-EL	Parmentier, E. M.	NSG 7605	5447
32	BROWN UNIVERSITY	Owens, F. C.	HQ-XE	Head, J. W.	NGT 00-050-147	5439
32	BROWN UNIVERSITY	Owens, F. C.	HQ-XE	Rutherford, M. J.	NGT 00-050-229	5440
32	BROWN UNIVERSITY	Owens, F. C.	HQ-XE	Schultz, P. H.	NGT 00-050-325	5441
32	BROWN UNIVERSITY	Owens, F. C.	HQ-XE	Pieters, C. M.	NGT 00-050-457	5443
32	CALIF INST OF TECH	Welker, J. E.	GSFC	Hager, B. H.	NAG 5-819	1503
32	CALIF INST OF TECH	Frey, H. V.	GSFC	Hager, B. H.	NAG 5-842	1504
32	CALIF INST OF TECH	Browne, I. D.	JSC	Wasserburg, G. J.	NAG 9-43	1523
32	CALIF INST OF TECH	Browne, I. D.	JSC	Albee, A. L.	NAG 9-185	1527
32	CALIF INST OF TECH	Browne, I. D.	JSC	Stopler, E. M.	NAG 9-236	1528
32	CALIF INST OF TECH	Browne, I. D.	JSC	Wyllie, P.	NAG 9-294	1529
32	CALIF INST OF TECH	Underwood, J.	HQ-EL	Stevenson, D. J.	NAGW 185	1532
32	CALIF INST OF TECH	Underwood, J.	HQ-EL	Murray, B.	NAGW 1226	1538
32	CALIF INST OF TECH	Underwood, J. R.	HQ-EL	Murray, B. C.	NAGW 1373	1541
32	CALIF INST OF TECH	Mahaffy, P. R.	HQ-EL	Muhleman, D. O.	NAGW 1432	1544
32	CALIF INST OF TECH	Underwood, J. R.	HQ-EL	Albee, A.	NAGW 1445	1546
32	CALIF INST OF TECH	Underwood, J. R.	HQ-EL	Burnett, D. S.	NAGW 1741	1554
32	CALIF INST OF TECH	Underwood, J.	HQ-EL	Ahrens, T. J.	NGL 05-002-105	1567

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32	CALIF INST OF TECH	Underwood, J. R.	HQ-EL	Ahrens, T. J.	NSG 7129	1584
32	CALIF INST OF TECH	Owens, F. C.	HQ-XE	Burnett, D. S.	NGT 00-050-471	1579
32	CALIF INST OF TECH	Owens, F. C.	HQ-LE	Murray, B.	NGT 00-050-096	1573
32	CAL ST POLY U POMONA	Scott, D. H.	HQ-EL	Rossbacher, L. A.	NAGW 715	1586
32	COLORADO STATE UNIV	Scott, D. H.	HQ-EL	Schumm, S. A.	NAGW 535	2393
32	COLUMBIA UNIVERSITY	Frey, H. V.	GSFC	Beavan, J.	NAG 5-799	4462
32	COLUMBIA UNIVERSITY	Walker, J. E.	GSFC	Cochran, J. R.	NAG 5-920	4465
32	COLUMBIA UNIVERSITY	Welker, J. E.	GSFC	Haxby, W. F.	NAG 5-1136	4469
32	CORNELL UNIVERSITY	Frey, H. V.	GSFC	Brown, L. D.	NAG 5-779	4525
32	CORNELL UNIVERSITY	Frey, H. V.	GSFC	Turcotte, D. L.	NAG 5-860	4527
32	CORNELL UNIVERSITY	Oseroff, H.	GSFC	Bird, J. M.	NAS 5-28739	4563
32	CORNELL UNIVERSITY	Oseroff, H.	GSFC	Bloom, A. L.	NAS 5-28767	4564
32	CORNELL UNIVERSITY	Soffen, G.	GSFC	Isacks, B. L.	NAS 5-30554	4565
32	CORNELL UNIVERSITY	Baltuck, M.	HQ-EE	Hoffman, J. T.	NAGW 1287	4554
32	CORNELL UNIVERSITY	Underwood, J. R.	HQ-EL	Thomas, P. C.	NAGW 111	4533
32	CORNELL UNIVERSITY	Underwood, J.	HQ-EL	Burns, J. A.	NAGW 310	4534
32	CORNELL UNIVERSITY	Underwood, J. R.	HQ-EL	Dermott, S. F.	NAGW 392	4535
32	CORNELL UNIVERSITY	Underwood, J. R.	HQ-EL	Nicholson, P. D.	NAGW 544	4537
32	CORNELL UNIVERSITY	Underwood, J. R.	HQ-EL	Bassett, W. A.	NAGW 963	4540
32	CORNELL UNIVERSITY	Underwood, J.	HQ-EL	Squyres, S.	NAGW 1023	4542
32	CORNELL UNIVERSITY	Underwood, J. R.	HQ-EL	Turcotte, D. L.	NAGW 1083	4543
32	CORNELL UNIVERSITY	Quaide, W. L.	HQ-EL	Veverka, J.	NAGW 1221	4552
32	CORNELL UNIVERSITY	Underwood, J. R.	HQ-EL	Turcotte, D. L.	NAGW 1420	4555
32	CORNELL UNIVERSITY	Underwood, J. R.	HQ-EL	Veverka, J.	NASW 3342	4568
32	CORNELL UNIVERSITY	Underwood, J. R.	HQ-EL	Sagan, C. E.	NGR 33-010-220	4574
32	CORNELL UNIVERSITY	Underwood, J. R.	HQ-EL	Veverka, J.	NSG 7156	4591
32	CORNELL UNIVERSITY	Underwood, J. R.	HQ-EL	Veverka, J.	NSG 7606	4592
32	CORNELL UNIVERSITY	Owens, F. C.	HQ-XE	Jordan, T.	NGT 00-050-242	4578
32	DARTMOUTH COLLEGE	Oseroff, H.	GSFC	Naslund, H. R.	NAS 5-28738	4273
32	DARTMOUTH COLLEGE	Mark, P. M.	HQ-EE	Birnie, R. W.	NASW 4049	4275
32	DARTMOUTH COLLEGE	Underwood, J. R.	HQ-EL	Brakenridge, G. R.	NAGW 1082	4270
32	FLORIDA STATE UNIV	Langel, R. A.	GSFC	Cain, J. C.	NAG 5-1070	2738
32	GEORGIA INST OF TECH	Johnson, D.	MSFC	Justus, C. G.	NAG 8-78	2872
32	HARVARD UNIVERSITY	Frey, H. V.	GSFC	Shapiro, I. I.	NAG 5-538	3669
32	HARVARD UNIVERSITY	Frey, H. V.	GSFC	O'connell, R. J.	NAG 5-840	3672
32	HARVARD UNIVERSITY	Welker, J. E.	GSFC	Bloxham, J.	NAG 5-918	3674
32	HARVARD UNIVERSITY	Welker, J. E.	GSFC	Woodhouse, J. H.	NAG 5-1128	3675
32	HARVARD UNIVERSITY	Rummel, J. D.	HQ-EB	Holland, A. D.	NAGW 599	3682
32	HARVARD UNIVERSITY	Rummel, J. D.	HQ-EB	Knoll, A. H.	NAGW 893	3684
32	HARVARD UNIVERSITY	Boyce, J. M.	HQ-EL	Cameron, A. G.	NAGW 1598	3691
32	HARVARD UNIVERSITY	Boyce, J. M.	HQ-EL	Cameron, A. G.	NGR 22-007-269	3702
32	HARVARD UNIVERSITY	Owens, F. C.	HQ-LE	Wood, J. A.	NGT 00-050-028	3705
32	HOWARD UNIVERSITY	Owens, F. C.	HQ-LE	Dey, B.	NGT 09-011-804	2706
32	HUMBOLDT STATE UNIV	Baltuck, M.	HQ-EE	Burke, R. M.	NGT 00-050-275	1623
32	INDIANA U-BLOOMINGTN	Browne, I. D.	JSC	Basu, A.	NSG 9077	3187
32	JOHNS HOPKINS UNIV	Welker, J.	GSFC	Poirier, D. R.	NAG 5-32	3448
32	JOHNS HOPKINS UNIV	Phinney, W. C.	JSC	Depaor, D.	NAG 9-217	3464
32	JOHNS HOPKINS UNIV	Rosendhal, J. D.	HQ-E	Olson, P. L.	NAGW 820	3468
32	JOHNS HOPKINS UNIV	Underwood, J. R.	HQ-EL	Olson, P.	NAGW 1750	3476
32	KANSAS STATE UNIV	Scott, D. H.	HQ-EL	Underwood, J. R.	NAGW 1111	3349
32	LAMAR UNIVERSITY	McKay, D. S.	JSC	Jordan, J.	NAG 9-376	5565
32	LA ST U&A&M COL-BRGE	Phinney, W. C.	JSC	Byerly, G. R.	NAG 9-136	3399
32	LA ST U&A&M COL-BRGE	Joyce, A. T.	SSC	Huh, O. K.	NAG13-4	3405
32	LA ST U&A&M COL-BRGE	Joyce, A. T.	SSC	Hudnall, W. H.	NAG13-5	3406
32	MASS INST OF TECH	Kouns, C. W.	GSFC	Molnar, P.	NAG 5-300	3753
32	MASS INST OF TECH	Frey, H. V.	GSFC	Jordan, T. H.	NAG 5-459	3754
32	MASS INST OF TECH	Choudhury, B.	GSFC	Eagleson, P. S.	NAG 5-510	3755
32	MASS INST OF TECH	Welker, J. E.	GSFC	Royden, L. H.	NAG 5-532	3756
32	MASS INST OF TECH	Frey, H. V.	GSFC	King, R. W.	NAG 5-737	3759
32	MASS INST OF TECH	Frey, H. V.	GSFC	Li, V. C.	NAG 5-740	3760

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32	MASS INST OF TECH	Frey, H. V.	GSFC	Toksoz, M. N.	NAG 5-753	3762
32	MASS INST OF TECH	Welker, J.	GSFC	Molnar, P.	NAG 5-795	3763
32	MASS INST OF TECH	Frey, H. V.	GSFC	Solomon, S. C.	NAG 5-814	3764
32	MASS INST OF TECH	Wildes, W.	GSFC	Niell, A. E.	NAS 5-29120	3836
32	MASS INST OF TECH	Wildes, W. T.	GSFC	Rogers, A. E.	NAS 5-30543	3839
32	MASS INST OF TECH	Browne, I. D.	JSC	Grove, T. L.	NAG 9-302	3791
32	MASS INST OF TECH	Underwood, J. R.	HQ-EL	French, R. G.	NAGW 656	3796
32	MASS INST OF TECH	Underwood, J. R.	HQ-EL	Wisdom, J.	NAGW 706	3798
32	MASS INST OF TECH	Underwood, J. R.	HQ-EL	Burns, R. G.	NAGW 1078	3806
32	MASS INST OF TECH	Underwood, J.	HQ-EL	Solomon, S. C.	NSG 7297	3882
32	MASS INST OF TECH	Underwood, J. R.	HQ-EL	Burns, R. G.	NSG 7604	3886
32	MISSISSIPPI STATE U	McCaleb, R. C.	SSC	Crochet, R. A.	NAS13-321	4160
32	NO CAROLINA STATE U	Soffen, G.	GSFC	Cohen, S.	NAS 5-30698	4804
32	NE LOUISIANA UNIV	Underwood, J.	HQ-EL	Dehon, R. A.	NAGW 1225	3413
32	NE LOUISIANA UNIV	Underwood, J. R.	HQ-EL	Dehon, R. A.	NAGW 1422	3414
32	NE LOUISIANA UNIV	Underwood, J. R.	HQ-EL	Dehon, R.	NSG 7534	3415
32	NORTHERN ARIZONA U	Boyce, J. M.	HQ-EL	Mullens, L. J.	NAGW 928	1282
32	NORTHERN ARIZONA U	Boyce, J. M.	HQ-EL	Holt, H. E.	NAGW 979	1283
32	NORTHERN ARIZONA U	Underwood, J. R.	HQ-EL	Swann, G. A.	NAGW 982	1284
32	NORTHWESTERN UNIV	Frey, H. V.	GSFC	Stein, S. A.	NAG 5-885	2999
32	NORTHWESTERN UNIV	Welker, J. E.	GSFC	Speed, R. C.	NAG 5-1008	3001
32	NORTHWESTERN UNIV	Welker, J. E.	GSFC	Stein, S.	NAG 5-1156	3004
32	OHIO STATE UNIV	Welker, J.	GSFC	Rapp, R. H.	NGR 36-008-161	5061
32	OHIO STATE UNIV	Frey, H. V.	GSFC	Mueller, I. I.	NSG 5265	5069
32	OREGON STATE UNIV	Welker, J. E.	GSFC	Ness, G. E.	NAG 5-1105	5192
32	OREGON STATE UNIV	Browne, I. D.	JSC	Schmitt, R. A.	NAG 9-63	5193
32	OREGON STATE UNIV	Underwood, J. R.	HQ-EL	Komar, P. D.	NSG 7178	5215
32	OREGON STATE UNIV	Owens, F. C.	HQ-XE	Frenkel, R. E.	NGT 00-050-244	5210
32	OREGON STATE UNIV	Owens, F. C.	HQ-XE	Frenkel, R.	NGT 00-050-351	5212
32	PENN STATE U-UNIV PK	Schneider, V.	JSC	Cavanagh, P. R.	NAG 9-379	5328
32	PRINCETON UNIVERSITY	Owens, F. C.	HQ-XE	Wood, E. F.	NGT 00-050-153	4358
32	PURDUE UNIVERSITY	Baltuck, M.	HQ-EE	Hinze, W. J.	NAGW 736	3221
32	RENSSELAER POLY-NY	Underwood, J. R.	HQ-EL	Gaffey, M. J.	NAGW 642	4639
32	RICE UNIVERSITY	Browne, I. D.	JSC	Heymann, D.	NAG 9-88	5584
32	RUTGERS ST U-N BRNSK	Browne, I. D.	JSC	Hewins, R. H.	NAG 9-35	4368
32	RUTGERS ST U-N BRNSK	Browne, I. D.	JSC	Delaney, J. S.	NAG 9-304	4369
32	SAN JOSE STATE UNIV	Browne, I. D.	JSC	Englert, P. A.	NAG 9-232	1648
32	SO DAKOTA SCHL MINES	Browne, I. D.	JSC	Papike, J. J.	NAG 9-22	5486
32	SO ILL UNIV-CARBONDL	Underwood, J. R.	HQ-EL	Kochel, R. C.	NAGW 707	3017
32	SOUTHERN METHODIST U	Underwood, J. R.	HQ-EL	Phillips, R. J.	NAGW 459	5611
32	SOUTHERN METHODIST U	Underwood, J. R.	HQ-EL	Phillips, R. J.	NAGW 1085	5612
32	STANFORD UNIVERSITY	Marais, D. D.	ARC	Lowe, D. R.	NCA 2-332	1782
32	STANFORD UNIVERSITY	Welker, J. E.	GSFC	Nur, A.	NAG 5-926	1714
32	STANFORD UNIVERSITY	Welker, J. E.	GSFC	Everitt, C. W.	NAG 5-1155	1717
32	STANFORD UNIVERSITY	Browne, I. D.	JSC	Lowe, D. R.	NAG 9-344	1726
32	STANFORD UNIVERSITY	Mahaffy, P.	HQ-EL	Timothy, J. G.	NAGW 1140	1735
32	STANFORD UNIVERSITY	Underwood, J. R.	HQ-EL	Eshleman, V. R.	NAGW 1755	1744
32	STANFORD UNIVERSITY	Underwood, J. R.	HQ-EL	Tyler, G. L.	NGR 05-020-649	1837
32	STATE UNIV NY-ALBANY	Browne, I. D.	JSC	Delano, J. W.	NAG 9-78	4661
32	STATE UNIV NY-ALBANY	Browne, I. D.	JSC	Berkley, J. L.	NAG 9-82	4662
32	STATE UNIV NY-ALBANY	Browne, I. D.	JSC	Hanson, G. N.	NAG 9-85	4663
32	STATE U NY-BINGHAMTN	Welker, J. E.	GSFC	Dickman, S. R.	NAG 5-145	4677
32	STATE U NY-BINGHAMTN	Owens, F. C.	HQ-LB	Dickman, S. R.	NGT 33-188-804	4682
32	STATE UNIV NY-BUFFAL	Scott, D. H.	HQ-EL	King, J. S.	NGR 33-015-108	4697
32	STATE U NY-STONY BRK	Underwood, J. R.	HQ-EL	Lissauer, J.	NAGW 1107	4716
32	STATE U NY-STONY BRK	Underwood, J. R.	HQ-EL	Owens, T.	NSG 7553	4731
32	SUL ROSS STATE UNIV	Underwood, J. R.	HQ-EL	Whitford-stark H, J. L.	NAGW 605	5615
32	TEXAS A&M UNIVERSITY	Flinn, E. A.	HQ-EE	Hilde, T. W.	NAGW 1304	5672
32	UNIV ALA-HUNTSVILLE	Lehoczky, S. L.	MSFC	Rosenberger, F. E.	NAG 8-704	1127
32	UNIV OF ARIZONA	Welker, J.	GSFC	Richardson, R. M.	NAG 5-326	1308

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32	UNIV OF ARIZONA	Welker, J. E.	GSFC	Chase, C. G.	NAG 5-444	1311
32	UNIV OF ARIZONA	Browne, I. D.	JSC	Patchett, P. J.	NAG 9-135	1341
32	UNIV OF ARIZONA	Browne, I. D.	JSC	Jull, A. J.	NAG 9-233	1342
32	UNIV OF ARIZONA	Browne, I. D.	JSC	Swindle, T. D.	NAG 9-240	1343
32	UNIV OF ARIZONA	Alexander, J. K.	HQ-E	Chase, C. G.	NAGW 1612	1407
32	UNIV OF ARIZONA	Underwood, J.	HQ-EL	Baker, V. R.	NAGW 285	1346
32	UNIV OF ARIZONA	Underwood, J. R.	HQ-EL	Melosh, H. J.	NAGW 428	1348
32	UNIV OF ARIZONA	Underwood, J. R.	HQ-EL	Fink, U.	NAGW 942	1365
32	UNIV OF ARIZONA	Underwood, J. R.	HQ-EL	Greenberg, R. J.	NAGW 944	1366
32	UNIV OF ARIZONA	Underwood, J. R.	HQ-EL	Porco, C. C.	NAGW 960	1367
32	UNIV OF ARIZONA	Underwood, J. R.	HQ-EL	Greenberg, R. J.	NAGW 1029	1369
32	UNIV OF ARIZONA	Underwood, J.	HQ-EL	Singer, R. B.	NAGW 1059	1371
32	UNIV OF ARIZONA	Evans, L. G.	HQ-EL	Boynton, W. V.	NAGW 1069	1372
32	UNIV OF ARIZONA	Underwood, J. R.	HQ-EL	Lebofsky, L. A.	NAGW 1146	1376
32	UNIV OF ARIZONA	Boyce, J. M.	HQ-EL	Gehrels, T.	NAGW 1147	1377
32	UNIV OF ARIZONA	Mahaffy, P.	HQ-EL	Tomasko, M.	NAGW 1280	1387
32	UNIV OF ARIZONA	Underwood, J. R.	HQ-EL	Vickery, A. M.	NAGW 1360	1395
32	UNIV OF ARIZONA	Underwood, J. R.	HQ-EL	Croft, S. K.	NAGW 1414	1398
32	UNIV OF ARIZONA	Mahaffy, P. R.	HQ-EL	Hsieh, K. C.	NAGW 1419	1399
32	UNIV OF ARIZONA	Underwood, J. R.	HQ-EL	Tittermore, W. A.	NAGW 1720	1412
32	UNIV OF ARIZONA	Underwood, J. R.	HQ-EL	Croft, S. K.	NAGW 1775	1414
32	UNIV OF ARIZONA	Underwood, J. R.	HQ-EL	Hood, L. L.	NSG 7020	1472
32	UNIV OF ARIZONA	Underwood, J.	HQ-EL	Strom, R. G.	NSG 7146	1477
32	UNIV OF ARIZONA	Underwood, J.	HQ-EL	Levy, E. H.	NSG 7419	1478
32	UNIV OF ARIZONA	Owens, F. C.	HQ-XE	Melosh, H. J.	NGT 00-050-234	1451
32	UNIV OF ARIZONA	Owens, F. C.	HQ-XE	Boynton, W. V.	NGT 00-050-235	1452
32	UNIV OF ARIZONA	Owens, F. C.	HQ-LE	Hubbard, W. B.	NGT 00-050-049	1445
32	UNIV OF ARIZONA	Owens, F. C.	HQ-LE	Hunten, D. M.	NGT 00-050-050	1446
32	UNIV ARKANSAS-FAYETV	Browne, I. D.	JSC	Sears, D. W.	NAG 9-81	1489
32	UNIV CALIF-BERKELEY	Underwood, J.	HQ-EL	Jeanloz, R.	NAGW 604	1900
32	UNIV CALIF-DAVIS	Pollack, J. B.	ARC	White, B. R.	NCC 2-252	2033
32	UNIV CALIF-DAVIS	Oseroft, H.	GSFC	Finnerty, A. A.	NAS 5-28754	2019
32	UNIV CALIF-L ANGELES	Welker, J.	GSFC	Schubert, G.	NAG 5-152	2072
32	UNIV CALIF-L ANGELES	Frey, H. V.	GSFC	Jackson, D. D.	NAG 5-447	2073
32	UNIV CALIF-L ANGELES	Welker, J. E.	GSFC	Kaula, W.	NAG 5-1040	2080
32	UNIV CALIF-L ANGELES	Browne, I. D.	JSC	Wasson, J. T.	NAG 9-40	2091
32	UNIV CALIF-L ANGELES	Browne, I. D.	JSC	Wasson, J. T.	NAG 9-96	2093
32	UNIV CALIF-L ANGELES	Rummel, J. D.	HQ-EB	Schopf, J. W.	NAGW 825	2103
32	UNIV CALIF-L ANGELES	Rummel, J. D.	HQ-EB	Schopf, J. W.	NGR 05-007-407	2149
32	UNIV CALIF-L ANGELES	Underwood, J. R.	HQ-EL	Paige, D. A.	NAGW 1065	2108
32	UNIV CALIF-L ANGELES	Underwood, J.	HQ-EL	Kaula, W. M.	NGL 05-007-002	2147
32	UNIV CALIF-L ANGELES	Underwood, J. R.	HQ-EL	Schubert, G.	NSG 7315	2163
32	UNIV CALIF-L ANGELES	Owens, F. C.	HQ-XE	Bird, G. P.	NGT 00-050-228	2150
32	UNIV CALIF-SAN DIEGO	Trombka, J. I.	GSFC	Arnold, J.	NAG 5-530	2178
32	UNIV CALIF-SAN DIEGO	Langel, R. A.	GSFC	Backus, G. E.	NAG 5-818	2179
32	UNIV CALIF-SAN DIEGO	Langel, R.	GSFC	Backus, G.	NAG 5-883	2180
32	UNIV CALIF-SAN DIEGO	Frey, H. V.	GSFC	Agnew, D. C.	NAG 5-905	2182
32	UNIV CALIF-SAN DIEGO	Frey, H.	GSFC	Gaskell, C.	NAG 5-1023	2185
32	UNIV CALIF-SAN DIEGO	Welker, J. E.	GSFC	Sandwell, D. T.	NAG 5-1266	2190
32	UNIV CALIF-SAN DIEGO	Browne, I. D.	JSC	Lugmair, G. W.	NAG 9-49	2199
32	UNIV CALIF-SAN DIEGO	Browne, I. D.	JSC	Thiemens, M. H.	NAG 9-83	2200
32	UNIV CALIF-SAN DIEGO	Rummel, J. D.	HQ-EB	Miller, S. R.	NAGW 20	2204
32	UNIV CALIF-S BARBARA	Chang, A. T.	GSFC	Dozier, J.	NAG 5-328	2287
32	UNIV CALIF-S BARBARA	Browne, I. D.	JSC	Cisowski, S. M.	NAG 9-224	2290
32	UNIV CALIF-S BARBARA	Browne, I. D.	JSC	Spera, F. J.	NAG 9-238	2291
32	UNIV CALIF-S BARBARA	Baltuck, M.	HQ-EE	Crowell, J. C.	NAGW 1246	2297
32	UNIV CALIF-S BARBARA	Underwood, J.	HQ-EL	Peale, S. J.	NGR 05-010-062	2304
32	UNIV CALIF-S CRUZ	Frey, H. V.	GSFC	Ward, S. N.	NAG 5-750	2307
32	UNIV CALIF-S CRUZ	Browne, I. D.	JSC	Collerson, K. D.	NAG 9-191	2308
32	UNIV CALIF-S CRUZ	Alexander, J. K.	HQ-E	Williams, Q.	NAGW 1577	2314

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32	UNIV CALIF-S CRUZ	Underwood, J. R.	HQ-EL	Bridges, F.	NAGW 590	2309
32	UNIV OF CHICAGO	Bindschadler, R. A.	GSFC	MacAyeal, D. R.	NAG 5-394	3025
32	UNIV OF CHICAGO	Browne, I. D.	JSC	Anders, E.	NAG 9-52	3036
32	UNIV OF CHICAGO	Browne, I. D.	JSC	Grossman, L.	NAG 9-54	3037
32	UNIV OF CHICAGO	Browne, I. D.	JSC	Richter, F. M.	NAG 9-67	3038
32	UNIV OF CHICAGO	Browne, I. D.	JSC	Wickham, S.	NAG 9-296	3040
32	UNIV OF CHICAGO	Rummel, J. D.	HQ-EB	Raup, D. M.	NAGW 1508	3052
32	UNIV OF CHICAGO	Rummel, J. D.	HQ-EB	Raup, D. M.	NAGW 1527	3053
32	UNIV OF CHICAGO	Rummel, J. D.	HQ-EB	Sepkoski, J. J.	NAGW 1693	3057
32	UNIV COLORADO-BOLDR	Frey, H. V.	GSFC	Wahr, J.	NAG 5-485	2426
32	UNIV COLORADO-BOLDR	Frey, H. V.	GSFC	Rosborough, G. W.	NAG 5-760	2429
32	UNIV COLORADO-BOLDR	Welker, J. E.	GSFC	Bilham, R.	NAG 5-1137	2448
32	UNIV COLORADO-BOLDR	Kouns, C. W.	GSFC	Benton, E.	NAS 5-29323	2519
32	UNIV COLORADO-BOLDR	Barnes, W.	GSFC	Goetz, A. F.	NAS 5-30552	2524
32	UNIV COLORADO-BOLDR	Alexander, J. K.	HQ-E	Kruse, F. A.	NAGW 1601	2507
32	UNIV COLORADO-BOLDR	Baltuck, M.	HQ-EE	Kruse, F. A.	NAGW 1143	2487
32	UNIV COLORADO-BOLDR	Baltuck, M.	HQ-EE	Goetz, A. F.	NAGW 1183	2489
32	UNIV COLORADO-BOLDR	Baltuck, M.	HQ-EE	Atkinson, W. W.	NAGW 1293	2495
32	UNIV COLORADO-BOLDR	Underwood, J. R.	HQ-EL	Esposito, L. W.	NAGW 769	2470
32	UNIV COLORADO-BOLDR	Underwood, J. R.	HQ-EL	Jakosky, B.	NAGW 771	2471
32	UNIV COLORADO-BOLDR	Underwood, J. R.	HQ-EL	Lee, S. W.	NAGW 1378	2496
32	UNIV COLORADO-BOLDR	Owens, F. C.	HQ-XE	Hay, W. W.	NGT 00-050-465	2555
32	UNIV COLORADO-BOLDR	Owens, F. C.	HQ-XE	Goetz, A. F.	NGT 00-050-490	2557
32	UNIV OF FLORIDA	Browne, I. D.	JSC	Mueller, P. A.	NAG 9-91	2781
32	UNIV OF HAWAII-MANOA	Baltuck, M.	HQ-EE	Mark, P. J.	NAGW 1162	2952
32	UNIV OF HAWAII-MANOA	Murphy, R.	HQ-EE	Singer, R. B.	NASW 4018	2971
32	UNIV OF HAWAII-MANOA	Underwood, J. R.	HQ-EL	Fanale, F. P.	NAGW 133	2937
32	UNIV OF HAWAII-MANOA	Underwood, J.	HQ-EL	Hawke, B. R.	NAGW 237	2938
32	UNIV OF HAWAII-MANOA	Underwood, J. R.	HQ-EL	Mark, P. M.	NAGW 437	2939
32	UNIV OF HAWAII-MANOA	Boyce, J. M.	HQ-EL	Morrison, D.	NAGW 498	2940
32	UNIV OF HAWAII-MANOA	Underwood, J.	HQ-EL	Fanale, F. P.	NAGW 583	2941
32	UNIV OF HAWAII-MANOA	Underwood, J.	HQ-EL	Fanale, F. P.	NAGW 633	2942
32	UNIV OF HAWAII-MANOA	Underwood, J., Jr.	HQ-EL	Bell, J. F.	NAGW 712	2943
32	UNIV OF HAWAII-MANOA	Underwood, J. R.	HQ-EL	Lucey, P. G.	NAGW 927	2948
32	UNIV OF HAWAII-MANOA	Underwood, J. R.	HQ-EL	Hawke, B. R.	NAGW 1053	2950
32	UNIV OF HAWAII-MANOA	Underwood, J. R.	HQ-EL	Mouginis Mark, P. J.	NAGW 1084	2951
32	UNIV OF HAWAII-MANOA	Underwood, J. R.	HQ-EL	Mouginis Mark, P. J.	NAGW 1345	2955
32	UNIV OF HAWAII-MANOA	Underwood, J. R.	HQ-EL	Zisk, S. H.	NAGW 1385	2957
32	UNIV OF HAWAII-MANOA	Underwood, J. R.	HQ-EL	Lucey, P. G.	NAGW 1421	2958
32	UNIV OF HAWAII-MANOA	Quaide, W. L.	HQ-EL	Fanale, F.	NAGW 1604	2963
32	UNIV OF HAWAII-MANOA	Underwood, J. R.	HQ-EL	McCord, T. B.	NSG 7312	2980
32	UNIV OF HAWAII-MANOA	Owens, F. C.	HQ-LE	Fanale, F. P.	NGT 00-050-104	2977
32	UNIV OF HAWAII-MANOA	Owens, F. C.	HQ-LE	Sinton, J. M.	NGT 12-004-801	2979
32	UNIV HOUSTON-HOUSTON	Welker, J.	GSFC	Casey, J. F.	NAG 5-585	5712
32	UNIV HOUSTON-HOUSTON	Browne, I. D.	JSC	Reid, A. M.	NAG 9-365	5731
32	UNIV HOUSTON-HOUSTON	Rummel, J. D.	HQ-EB	Oro, J.	NGR 44-005-002	5743
32	UNIV HOUSTON-HOUSTON	Underwood, J.	HQ-EL	Woronow, A.	NAGW 439	5737
32	UNIV ILLINOIS-CHICGO	Browne, I. D.	JSC	Davis, A. M.	NAG 9-111	3104
32	UNIV ILLINOIS-URBANA	Oseroff, H.	GSFC	Iverson, L.	NAS 5-28781	3139
32	UNIV MARYLAND-COL PK	Freg, H.	GSFC	Bell, R. A.	NAG 5-245	3523
32	UNIV MARYLAND-COL PK	Bell, R.	GSFC	McLellan, E.	NAG 5-968	3548
32	UNIV MARYLAND-COL PK	Cressy, P. J.	GSFC	Sommer, S. E.	NSG 5047	3634
32	UNIV MARYLAND-COL PK	Bell, R.	GSFC	Chang, L. L.	NSG 5423	3637
32	UNIV MARYLAND-COL PK	Bergstrahl, J. T.	HQ-EL	A'hearn, M. J.	NAGW 1813	3590
32	UNIV OF MASS-AMHERST	Browne, I. D.	JSC	McGill, G. E.	NAG 9-75	3905
32	UNIV OF MASS-AMHERST	Rummel, J. D.	HQ-EB	Irvine, W. M.	NAGW 436	3907
32	UNIV OF MASS-AMHERST	Underwood, J. R.	HQ-EL	McGill, G. E.	NAGW 1079	3909
32	UNIV OF MASS-AMHERST	Underwood, J.	HQ-EL	Condit, C. D.	NAGW 1236	3911
32	UNIV OF MASS-AMHERST	Underwood, J.	HQ-EL	McGill, G. E.	NGR 22-010-076	3921
32	UNIV OF MASS-AMHERST	Owens, F. C.	HQ-XE	Brown, L.	NGT 00-050-161	3923

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32	UNIV OF MIAMI	Welker, J. E.	GSFC	Harrison, C. G.	NAG 5-414	2804
32	UNIV OF MIAMI	Frey, H. V.	GSFC	Harrison, C. G.	NAG 5-741	2805
32	UNIV OF MIAMI	Oseroff, H.	GSFC	Harrison, C. G.	NAS 5-28745	2811
32	UNIV OF MIAMI	Baltuck, M.	HQ-EE	Harrison, C. G.	NAGW 1678	2810
32	UNIV OF MIAMI	Owens, F. C.	HQ-XE	Harrison, C. A.	NGT 00-070-010	2821
32	UNIV MICH-ANN ARBOR	Garvin, J. B.	GSFC	Ulaby, F. T.	NAG 5-843	4005
32	UNIV MICH-ANN ARBOR	Quaide, W.	HQ-EL	Killeen, T. L.	NASW 4200	4063
32	U MINN-MNPLS-ST PAUL	Welker, J. E.	GSFC	Yuen, D. A.	NAG 5-770	4106
32	U MINN-MNPLS-ST PAUL	Browne, I. D.	JSC	Pepin, R. O.	NAG 9-60	4113
32	U MINN-MNPLS-ST PAUL	Rosendhal, J. D.	HQ-E	Yuen, D. A.	NAGW 1008	4117
32	U MINN-MNPLS-ST PAUL	Owens, F. C.	HQ-XE	Yuen, D. A.	NGT 00-050-200	4132
32	U MINN-MNPLS-ST PAUL	Owens, F. C.	HQ-LE	Alexander, E. C., Jr.	NGT 25-001-800	4138
32	UNIV OF NEVADA-RENO	Oseroff, H.	GSFC	Taranik, J. V.	NAS 5-28765	4257
32	UNIV OF NEVADA-RENO	Baltuck, M.	HQ-EE	Mouat, D. A.	NAGW 913	4254
32	UNIV OF NEVADA-RENO	Tuyahov, A. J.	HQ-EE	Taranik, J. V.	NAGW 923	4255
32	UNIV OF NEVADA-RENO	Baltuck, M.	HQ-EE	Taranik, J. V.	NAGW 1679	4256
32	UNIV OF NEVADA-RENO	Owens, F. C.	HQ-XE	Taranik, J. V.	NGT 00-050-157	4260
32	UNIV OF NEW MEXICO	Browne, I. D.	JSC	Keil, K.	NAG 9-30	4419
32	UNIV OF NEW MEXICO	Browne, I. D.	JSC	Rietmeijer, F. J.	NAG 9-160	4420
32	UNIV OF NEW MEXICO	Duke, M.	JSC	Taylor, G. J.	NAG 9-354	4422
32	UNIV OF NEW MEXICO	Underwood, J.	HQ-EL	Elston, W. E.	NGR 32-004-062	4424
32	UNIV OF NEW MEXICO	Owens, F. C.	HQ-LE	Grover, H. D.	NGT 00-070-003	4425
32	UNIV OREGON-EUGENE	Frey, H. V.	GSFC	Humphreys, E. D.	NAG 5-755	5222
32	U PUERTO RICO-RIO PI	Owens, F. C.	HQ-XE	Baez, A. D.	NGT 00-070-160	6481
32	UNIV SO CAROLINA-COL	Browne, I. D.	JSC	Shervais, J. W.	NAG 9-169	5478
32	UNIV OF SOUTHERN CAL	Mahaffy, P.	HQ-EL	Iwanczyk, J. S.	NAGW 1401	2362
32	UNIV TENNESSEE-KNOXV	Browne, I. D.	JSC	McSween, H. Y.	NAG 9-58	5514
32	UNIV TENNESSEE-KNOXV	Browne, I. D.	JSC	Taylor, L. A.	NAG 9-62	5515
32	UNIV TEXAS-AUSTIN	Welker, J. E.	GSFC	Schutz, B.	NAG 5-528	5778
32	UNIV TEXAS-AUSTIN	Frey, H. V.	GSFC	Shelus, P. J.	NAG 5-754	5780
32	UNIV TEXAS-AUSTIN	Frey, H. V.	GSFC	Wilson, C. R.	NAG 5-756	5781
32	UNIV TEXAS-AUSTIN	Frey, H. V.	GSFC	Schutz, B. E.	NAG 5-757	5782
32	UNIV TEXAS-AUSTIN	Welker, J. E.	GSFC	Sandwell, D. T.	NAG 5-787	5783
32	UNIV TEXAS-AUSTIN	Kolenkiewicz, R.	GSFC	Tapley, B. D.	NAG 5-940	5784
32	UNIV TEXAS-AUSTIN	Kolenkiewicz, R.	GSFC	Tapley, B. D.	NAG 5-1021	5788
32	UNIV TEXAS-AUSTIN	Welker, J. E.	GSFC	Sclater, J. G.	NAG 5-1041	5789
32	UNIV TEXAS-AUSTIN	Underwood, J. R.	HQ-EL	Nakamura, Y.	NAGW 1064	5813
32	UNIV TEXAS-AUSTIN	Underwood, J. R.	HQ-EL	Smoluchowski, R.	NSG 7505	5858
32	UNIV TEXAS-AUSTIN	Owens, F. C.	HQ-XE	Wilson, C. R.	NGT 00-070-029	5851
32	UNIV TEXAS-DALLAS	Baltuck, M.	HQ-EE	Stern, R. J.	NAGW 1161	5867
32	UNIV OF UTAH	Oseroff, H.	GSFC	Currey, D. R.	NAS 5-28753	5938
32	UNIV OF VIRGINIA	Underwood, J.	HQ-EL	Johnson, R. E.	NAGW 186	6124
32	UNIV OF VIRGINIA	Scott, D. H.	HQ-EL	Roberts, W. W.	NAGW 929	6127
32	UNIV OF VIRGINIA	Underwood, J. R.	HQ-EL	Boring, J. W.	NAGW 1733	6134
32	UNIV OF VIRGINIA	Underwood, J. R.	HQ-EL	Howard, A. D.	NSG 7572	6154
32	UNIV OF WASHINGTON	Browne, I. D.	JSC	McCallum, I. S.	NAG 9-84	6281
32	UNIV OF WASHINGTON	Tuyahov, A. J.	HQ-EE	Adams, J. B.	NAGW 85	6283
32	UNIV OF WASHINGTON	Wickland, D. E.	HQ-EE	Adams, J. B.	NAGW 1135	6299
32	UNIV OF WASHINGTON	Baltuck, M.	HQ-EE	Gillespie, A. R.	NAGW 1317	6305
32	UNIV OF WASHINGTON	Baltuck, M.	HQ-EE	Adams, J. B.	NAGW 1319	6306
32	UNIV OF WASHINGTON	Evans, D.	HQ-EE	Adams, J. B.	NASW 4016	6322
32	UNIV OF WASHINGTON	Underwood, J. R.	HQ-EL	Holsapple, K. A.	NAGW 328	6285
32	UNIV OF WASHINGTON	Underwood, J. R.	HQ-EL	Adams, J. B.	NAGW 1081	6297
32	UNIV OF WASHINGTON	Underwood, J. R.	HQ-EL	Warren, S. G.	NAGW 1734	6316
32	UNIV OF WASHINGTON	Underwood, J.	HQ-EL	Adams, J. B.	NSG 7173	6340
32	UNIV WISC-MADISON	Phinney, W. C.	JSC	Brown, P. E.	NAG 9-189	6409
32	UTAH STATE UNIV	Knott, W. M.	KSC	Salisbury, F. B.	NAG10-14	5949
32	WASHINGTON UNIVERSTY	Browne, I. D.	JSC	Walker, R. M.	NAG 9-55	4193
32	WASHINGTON UNIVERSTY	Browne, I. D.	JSC	Haskin, L. A.	NAG 9-56	4194
32	WASHINGTON UNIVERSTY	Phinney, W. C.	JSC	Dymek, R. F.	NAG 9-98	4195

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32	WASHINGTON UNIVERSITY	Browne, I. D.	JSC	Bowring, S. A.	NAG 9-223	4196
32	WASHINGTON UNIVERSITY	Browne, I. D.	JSC	Podosek, F.	NAG 9-292	4197
32	WASHINGTON UNIVERSITY	Baltuck, M.	HQ-EE	Arvidson, R. E.	NAGW 1358	4203
32	WASHINGTON UNIVERSITY	Underwood, J.	HQ-EL	McKinnon, W. B.	NAGW 432	4199
32	WASHINGTON UNIVERSITY	Mahaffy, P.	HQ-EL	Walker, R. M.	NAGW 1603	4204
32	WASHINGTON UNIVERSITY	Scott, D. H.	HQ-EL	Arvidson, R. E.	NSG 7087	4225
32	WASHINGTON UNIVERSITY	Owens, F. C.	HQ-XE	Podeseck, F.	NGT 00-050-181	4218
32	WASHINGTON UNIVERSITY	Owens, F. C.	HQ-XE	Arvidson, R. E.	NGT 00-050-289	4221
32	WELLESLEY COLLEGE	Underwood, J.	HQ-EL	French, R. G.	NAGW 1368	3932
32	WOODSHOLE OCEAN INST	Phinney, W. C.	JSC	Kurz, M. D.	NAG 9-69	3940
33	CITY UNIV N Y SYSTEM	Lagerloef, G. S.	HQ-EE	Pierson, W. J.	NAGW 690	4440
33	COLUMBIA UNIVERSITY	Richman, J. G.	HQ-EE	Cane, M. A.	NAGW 916	4487
33	COLUMBIA UNIVERSITY	Thomas, R. H.	HQ-EE	Jacobs, S. S.	NAGW 1344	4488
33	COLUMBIA UNIVERSITY	Thomas, R. H.	HQ-EE	Gordon, A. L.	NAGW 1752	4493
33	FLORIDA ATLANTIC U	Mac dowell, L.	KSC	Smith, D.	NAS10-11574	2725
33	FLORIDA STATE UNIV	Lagerloef, G. S.	HQ-EE	O'brien, J. J.	NAGW 985	2744
33	FLORIDA STATE UNIV	Kurylo, M. J.	HQ-EE	Chanton, J. P.	NAGW 1823	2747
33	FLORIDA STATE UNIV	Thomas, R. H.	HQ-EE	O'brien, J. J.	NGT 10-004-800	2757
33	FLORIDA STATE UNIV	Owens, F. C.	HQ-XE	Fuelberg, H. E.	NGT 00-070-095	2756
33	FLORIDA STATE UNIV	Owens, F. C.	HQ-LE	Iverson, R. L.	NGT 00-050-042	2749
33	HOFSTRA UNIVERSITY	Lagerloef, G. S.	HQ-EE	Weissman, D. E.	NAGW 468	4594
33	HOWARD UNIVERSITY	Magolis, M.	HQ-U	Dey, B.	NAGW 898	2700
33	INDIANA UNIV OF PA	Hoge, F. E.	GSFC	Berry, R. E.	NAG 5-641	5258
33	INDIANA UNIV OF PA	Hoge, F. E.	GSFC	Berry, R. E.	NAG 5-650	5259
33	MASS INST OF TECH	Richman, J. G.	HQ-EE	Wunsch, C.	NAGW 1048	3804
33	MASS INST OF TECH	Lagerloef, G. S.	HQ-EE	Melville, W. K.	NAGW 1272	3811
33	MASS INST OF TECH	Owens, F. C.	HQ-XE	Melville, W. K.	NGT 00-050-292	3870
33	NEW YORK UNIVERSITY	Yoder, J. A.	HQ-EE	Volk, T.	NAGW 850	4610
33	OREGON STATE UNIV	Lagerloef, G. S.	HQ-EE	Chelton, D. B.	NAGW 730	5194
33	OREGON STATE UNIV	Yoder, J. A.	HQ-EE	Chelton, D. B.	NAGW 869	5195
33	OREGON STATE UNIV	Richman, J. G.	HQ-EE	Chelton, D. B.	NAGW 1123	5196
33	OREGON STATE UNIV	Lewis, M. R.	HQ-EE	Strub, P. T.	NAGW 1251	5198
33	OREGON STATE UNIV	Richman, J. G.	HQ-EE	Bennett, A. F.	NAGW 1305	5200
33	OREGON STATE UNIV	Lewis, M. R.	HQ-EE	Abbott, M. R.	NAGW 1316	5201
33	OREGON STATE UNIV	Lagerloef, G. S.	HQ-EE	Richman, J. G.	NAGW 1451	5202
33	PENN STATE U-UNIV PK	Soffen, G.	GSFC	Barron, E.	NAS 5-30556	5342
33	PENN STATE U-UNIV PK	Thomas, R. H.	HQ-EE	Crane, R. G.	NAGW 1042	5330
33	PRINCETON UNIVERSITY	Soffen, G.	GSFC	Wood, E. F.	NAS 5-33005	4353
33	PRINCETON UNIVERSITY	Thomas, R. H.	HQ-EE	Phelan, M. J.	NAGW 1763	4347
33	ROCHESTER INST TECH	Richman, J. G.	HQ-EE	Scioremammano, F.	NAGW 888	4652
33	STANFORD UNIVERSITY	Thomas, R. H.	HQ-EE	Vesecky, J.	NAGW 628	1732
33	TEXAS A&M UNIVERSITY	Yoder, J. A.	HQ-EE	Hofmann, E. E.	NAGW 852	5670
33	TEXAS A&M UNIVERSITY	Lagerloef, G. S.	HQ-EE	Stewart, R. H.	NAGW 1836	5675
33	UNIV ALASKA-FAIRBNKS	Oseroff, H.	GSFC	Royer, T. C.	NAS 5-28762	1217
33	UNIV ALASKA-FAIRBNKS	Jezek, K. C.	HQ-EE	Weller, G.	NAGW 932	1208
33	UNIV ALASKA-FAIRBNKS	Jezek, K. C.	HQ-EE	Weeks, W. F.	NAGW 1051	1209
33	UNIV CALIF-SAN DIEGO	Maynard, N. G.	GSFC	Mueller, J. L.	NAG 5-1022	2184
33	UNIV CALIF-SAN DIEGO	Lewis, M. R.	HQ-EE	Simpson, J. J.	NAGW 683	2208
33	UNIV CALIF-SAN DIEGO	Lewis, M. R.	HQ-EE	Eppley, R. W.	NAGW 993	2212
33	UNIV CALIF-SAN DIEGO	Richman, J. G.	HQ-EE	Stewart, R. H.	NAGW 1038	2214
33	UNIV CALIF-SAN DIEGO	Yoder, J. A.	HQ-EE	Holm-hansen, O.	NAGW 1070	2215
33	UNIV CALIF-SAN DIEGO	Lagerloef, G. S.	HQ-EE	Filloux, J. H.	NAGW 1126	2216
33	UNIV CALIF-SAN DIEGO	Wickland, D.	HQ-EE	Mueller, J. L.	NAGW 1136	2217
33	UNIV CALIF-SAN DIEGO	Yoder, J. A.	HQ-EE	Stewart, R. H.	NAGW 1237	2220
33	UNIV CALIF-SAN DIEGO	Richman, J. G.	HQ-EE	Stewart, R. H.	NAGW 1271	2221
33	UNIV CALIF-SAN DIEGO	Owens, F. C.	HQ-XE	Somerville, R. C.	NGT 00-050-057	2253
33	UNIV CALIF-SAN DIEGO	Owens, F. C.	HQ-XE	Abbott, M. R.	NGT 00-050-158	2255
33	UNIV CALIF-SAN DIEGO	Owens, F. C.	HQ-XE	Gautier, C.	NGT 00-050-304	2262
33	UNIV CALIF-S BARBARA	Lewis, M. R.	HQ-EE	Smith, R. C.	NAGW 290	2292
33	UNIV COLORADO-BOLDR	Cavaleri, D. J.	GSFC	Steffen, K.	NAG 5-882	2435

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33	UNIV COLORADO-BOLDR	Cavalieri, D. J.	GSFC	Emery, W. J.	NAG 5-930	2438
33	UNIV COLORADO-BOLDR	Thomas, R. H.	HQ-EE	Barry, R. G.	NAGW 641	2468
33	UNIV COLORADO-BOLDR	Lagerloef, G. S.	HQ-EE	Emery, W. J.	NAGW 1110	2483
33	UNIV COLORADO-BOLDR	Lagerloef, G. S.	HQ-EE	Born, G.	NAGW 1124	2485
33	UNIV COLORADO-BOLDR	Njoku, E. G.	HQ-EE	Emery, W. J.	NAGW 1264	2494
33	UNIV COLORADO-BOLDR	Thomas, R. H.	HQ-EE	Maslanik, J.	NAGW 1786	2513
33	UNIV OF DELAWARE	Lagerloef, G. S.	HQ-EE	Webster, F.	NAGW 1674	2627
33	UNIV OF GEORGIA	McClain, C. R.	GSFC	Menzel, D. W.	NAG 5-1111	2914
33	UNIV OF GEORGIA	Lewis, M.	HQ-EE	Yoder, J. A.	NAGW 1500	2920
33	UNIV OF HAWAII-MANOA	Soffen, G.	GSFC	Lukas, R.	NAS 5-33006	2969
33	UNIV ILLINOIS-URBANA	Thomas, R. H.	HQ-EE	Walsh, J. E.	NAGW 1389	3135
33	UNIV OF KANSAS	Lagerloef, G. S.	HQ-EE	Gogineni, P.	NAGW 1278	3361
33	UNIV OF MASS-AMHERST	Thomas, R. H.	HQ-EE	Swift, C. T.	NAGW 559	3908
33	UNIV OF MASS-AMHERST	Lagerloef, G. S.	HQ-EE	McIntosh, R. E.	NAGW 1112	3910
33	UNIV OF MIAMI	Oakes, A.	GSFC	Evans, R.	NAS 5-29352	2813
33	UNIV OF MIAMI	Soffen, G.	GSFC	Brown, O. B.	NAS 5-30557	2814
33	UNIV OF MIAMI	Lewis, M. R.	HQ-EE	Brown, O.	NAGW 273	2808
33	UNIV OF MIAMI	Lewis, M. R.	HQ-EE	Balch, W. M.	NAGW 1291	2809
33	UNIV NEBRASKA-LINCLN	Thomas, R. H.	HQ-EE	Anderson, M. R.	NAGW 1266	4247
33	UNIV NEW HAMP-DURHAM	Lewis, M. R.	HQ-EE	Moore, B., III	NAGW 848	4291
33	U PUERTO RICO-MAYAGZ	Owens, F. C.	HQ-XE	Lopez, J. M.	NGT 00-070-099	6475
33	UNIV OF RHODE ISLAND	Yoder, J. A.	HQ-EE	Cornillon, P.	NAGW 858	5450
33	UNIV OF SO FLORIDA	Lewis, M. R.	HQ-EE	Carder, K. L.	NAGW 465	2825
33	UNIV OF SO FLORIDA	Lewis, M. R.	HQ-EE	Carder, K. L.	NAGW 678	2826
33	UNIV OF SOUTHERN CAL	Lewis, M. R.	HQ-EE	Kiefer, D. A.	NAGW 317	2360
33	UNIV OF WASHINGTON	Thomas, R. T.	HQ-EE	Rothrock, D. A.	NAGW 412	6286
33	UNIV OF WASHINGTON	Yoder, J. A.	HQ-EE	Perry, M. J.	NAGW 845	6291
33	UNIV OF WASHINGTON	Yoder, J. A.	HQ-EE	Perry, M. J.	NAGW 889	6292
33	UNIV OF WASHINGTON	Jezek, K. C.	HQ-EE	Grenfell, T.	NAGW 945	6293
33	UNIV OF WASHINGTON	Lewis, M. R.	HQ-EE	Banse, K.	NAGW 1007	6294
33	UNIV OF WASHINGTON	Jezek, K. C.	HQ-EE	Martin, S.	NAGW 1045	6295
33	UNIV OF WASHINGTON	Jezek, K. C.	HQ-EE	Colony, R. L.	NAGW 1243	6303
33	UNIV OF WASHINGTON	Thomas, R. H.	HQ-EE	Winebrenner, D. P.	NAGW 1256	6304
33	UNIV OF WASHINGTON	Lagerloef, G. S.	HQ-EE	Katsaros, K. B.	NAGW 1322	6307
33	UNIV OF WASHINGTON	Thomas, R. H.	HQ-EE	Martin, S.	NAGW 1436	6310
33	UNIV OF WASHINGTON	Owens, F. C.	HQ-XE	Martin, S.	NGT 00-050-322	6332
33	UNIV OF WASHINGTON	Owens, F. C.	HQ-XE	Riser, S. C.	NGT 00-050-391	6333
33	UNIV WISC-MADISON	Thomas, R. H.	HQ-EE	Bentley, C. R.	NAGW 1773	6425
33	WOODSHOLE OCEAN INST	Soffen, G.	GSFC	Brewer, P. G.	NAS 5-30572	3947
33	WOODSHOLE OCEAN INST	Lagerloef, G. S.	HQ-EE	Graber, H. C.	NAGW 1024	3942
33	WOODSHOLE OCEAN INST	Richman, J. G.	HQ-EE	Joyce, T. M.	NAGW 1026	3943
33	WOODSHOLE OCEAN INST	Yoder, J. A.	HQ-EE	Brewer, P. G.	NAGW 1314	3944
33	WOODSHOLE OCEAN INST	Lagerloef, G. S.	HQ-EE	Kelly, K. A.	NAGW 1666	3945
33	WOODSHOLE OCEAN INST	Lagerloef, G. S.	HQ-EE	Plant, W. J.	NAGW 1675	3946
33	WOODSHOLE OCEAN INST	Owens, F. C.	HQ-XE	Dacey, J. W.	NGT 00-050-456	3948
39	AUBURN UNIV-AUBURN	Arnold, R.	HQ-EE	Hajek, B. F.	NAGW 758	1033
39	COLORADO STATE UNIV	Levine, E. R.	GSFC	Schimel, D. S.	NAG 5-910	2387
39	COLUMBIA UNIVERSITY	Soffen, G.	GSFC	Kastens, K.	NAS 5-33018	4494
39	COLUMBIA UNIVERSITY	Travis, L.	GSFC	Zobler, L.	NCC 5-32	4499
39	COLUMBIA UNIVERSITY	Kurylo, M. J.	HQ-EE	Fairbanks, R. G.	NAGW 835	4483
39	CORNELL UNIVERSITY	Wickland, D. E.	HQ-EE	Mills, E. L.	NAGW 1087	4544
39	DUKE UNIVERSITY	Wickland, D. E.	HQ-EE	Christensen, N. L.	NAGW 1339	4760
39	FLORIDA STATE UNIV	Holben, B. N.	GSFC	Nicholson, S. E.	NAG 5-764	2734
39	FLORIDA STATE UNIV	Choudhury, B.	GSFC	Smith, E. A.	NAG 5-891	2737
39	GEORGIA INST OF TECH	Welker, J. E.	GSFC	Hager, B. H.	NAG 5-1132	2871
39	GEORGIA INST OF TECH	Fitzjarrald, D.	MSFC	Patterson, E. M.	NAG 8-626	2874
39	HUNTER COLLEGE	Goward, S. N.	HQ-EE	Strahler, A. H.	NAGW 735	4595
39	KANSAS STATE UNIV	Levine, E. R.	GSFC	Seastedt, T. R.	NAG 5-897	3348
39	LA ST U&A&M COL-BRGE	Oseroff, H.	GSFC	Gosselink, J. G.	NAS 5-28756	3407
39	LA ST U&A&M COL-BRGE	Stetina, F.	GSFC	Hill, J. M.	NAS 5-30561	3409

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39	LA ST U&A&M COL-BRGE	Lasane, G.	HQ-EE	Roberts, H. H.	NAGW 1552	3404
39	MASS INST OF TECH	Soffen, G.	GSFC	Eagleson, P.	NAS 5-33003	3841
39	MASS INST OF TECH	Soffen, G.	GSFC	Reilinger, R.	NAS 5-33020	3842
39	MASS INST OF TECH	Plaza, A. L.	JSC	Bussolari, S. R.	NAG 9-125	3787
39	MASS INST OF TECH	Asrar, G.	HQ-EE	Eagleson, P.	NAGW 1696	3826
39	MIDDLE TENN ST UNIV	Sever, T. L.	SSC	Fullerton, R. O.	NAS13-370	5495
39	MISSISSIPPI STATE U	Wolverton, B. C.	SSC	Esher, R. J.	NAG13-6	4153
39	MISSISSIPPI STATE U	Wolverton, B. C.	SSC	Esher, R. J.	NAG13-8	4154
39	NEW MEX ST U-LAS CR	Nock, R. S.	GSFC	Halligan, J. E.	NAS 5-29800	4399
39	NO CAROLINA STATE U	Kurylo, M. J.	HQ-EE	Blair, N. E.	NAGW 838	4801
39	OLD DOMINION UNIV	Owens, F. C.	HQ-XE	Brown, K. G.	NGT 00-070-058	6087
39	OREGON STATE UNIV	Wickland, D. E.	HQ-EE	Waring, R. H.	NAGW 1717	5204
39	OREGON STATE UNIV	Owens, F. C.	HQ-XE	Waring, R.	NGT 00-050-520	5214
39	PENN STATE U-UNIV PK	Pollack, J. B.	ARC	Kasting, J. F.	NCA 2-369	5353
39	PENN STATE U-UNIV PK	Knott, W.	KSC	Cosgrove, D. J.	NAG10-39	5340
39	PENN STATE U-UNIV PK	Tuyahov, A. J.	HQ-EE	Warner, T. T.	NAGW 1430	5335
39	PENN STATE U-UNIV PK	Wickland, D. E.	HQ-EE	Peterson, G. W.	NGT 00-050-282	5361
39	PRINCETON UNIVERSITY	Owe, M.	GSFC	Milly, E.	NAG 5-899	4334
39	PURDUE UNIVERSITY	Schmerling, E. R.	HQ-E	Collier, R.	NAGW 1056	3224
39	PURDUE UNIVERSITY	Tuyahov, A. J.	HQ-EE	Daughtry, C. S.	NAGW 799	3222
39	PURDUE UNIVERSITY	Tuyahov, A. J.	HQ-EE	Johannsen, C. J.	NAGW 925	3223
39	PURDUE UNIVERSITY	Huntress, W.	HQ-EE	Johannsen, C. J.	NAGW 1472	3225
39	RICE UNIVERSITY	Mellott, M. M.	HQ-ES	Hill, T. W.	NAGW 482	5598
39	SAN DIEGO STATE UNIV	Choudhury, B.	GSFC	Hope, A. S.	NAG 5-911	1628
39	SAN DIEGO STATE UNIV	Hill, C. L.	SSC	Stow, D. A.	NAS13-373	1631
39	SO DAKOTA STATE UNIV	Oseroff, H.	GSFC	Lewis, J. K.	NAS 5-28766	5487
39	STANFORD UNIVERSITY	Sebesta, P. D.	ARC	Remson, I.	NCA 2-344	1787
39	STANFORD UNIVERSITY	Wales, R. O.	GSFC	Helliwell, R. A.	NAG 5-1103	1716
39	STANFORD UNIVERSITY	Wickland, D. E.	HQ-EE	Lyon, R. J.	NAGW 1252	1738
39	STATE U NY-STONY BRK	Kurylo, M. J.	HQ-EE	Varanasi, P.	NAGW 1238	4717
39	TUSKEGEE UNIVERSITY	Knott, W. M.	KSC	Hill, W. A.	NAG10-24	1068
39	UNIV ALA-HUNTSVILLE	Snyder, R.	MSFC	Rosenberger, F. E.	NAG 8-711	1130
39	UNIV ALASKA-FAIRBNKS	Kurylo, M. J.	HQ-EE	Reeburgh, W. S.	NAGW 841	1206
39	UNIV OF ARIZONA	Lawless, J. G.	ARC	Ganapol, B. D.	NCA 2-349	1431
39	UNIV OF ARIZONA	Tuyahov, A. J.	HQ-EE	Hutchinson, C.	NAGW 1217	1386
39	UNIV OF ARIZONA	Miller, T. L.	HQ-EE	Hutchinson, C. F.	NAGW 1359	1394
39	UNIV OF ARIZONA	Asrar, G.	HQ-EE	Sorooshian, S.	NGT 00-050-273	1454
39	UNIV CALIF-BERKELEY	Hill, C. L.	SSC	Biging, G. S.	NAS13-375	1937
39	UNIV CALIF-BERKELEY	Miller, T. L.	HQ-EE	Congalton, R. G.	NAGW 881	1904
39	UNIV CALIF-DAVIS	Toll, D. L.	GSFC	Paw U, K. T.	NAG 5-937	2012
39	UNIV CALIF-DAVIS	Fitzjarald, D. E.	MSFC	Carroll, J. J.	NAS 8-36550	2020
39	UNIV CALIF-L ANGELES	Des Marais, D. J.	ARC	Farmer, J.	NCA 2-352	2137
39	UNIV CALIF-L ANGELES	Mellott, M. M.	HQ-ES	Abdulla, M. A.	NAGW 78	2096
39	UNIV CALIF-L ANGELES	Mellott, M. M.	HQ-ES	Coleman, P. J.	NGL 05-007-004	2148
39	UNIV CALIF-SAN DIEGO	Choudhury, B.	GSFC	Gautier, C. H.	NAG 5-900	2181
39	UNIV CALIF-SAN DIEGO	Kurylo, M. J.	HQ-EE	George, W. M.	NAGW 972	2210
39	UNIV CALIF-SAN DIEGO	Dodge, J. C.	HQ-EE	Gautier, C.	NAGW 981	2211
39	UNIV CALIF-S BARBARA	Choudhury, B.	GSFC	Dozier, J.	NAG 5-917	2288
39	UNIV CALIF-S BARBARA	Oseroff, H.	GSFC	Dozier, J.	NAS 5-28770	2301
39	UNIV CALIF-S BARBARA	Bredenkamp, J.	HQ-EC	Estes, J. E.	NAGW 987	2294
39	UNIV CALIF-S BARBARA	Tuyahov, A. J.	HQ-EE	Estes, J. E.	NAGW 455	2293
39	UNIV CALIF-S BARBARA	Wickland, D. E.	HQ-EE	Dozier, J.	NAGW 1137	2296
39	UNIV CALIF-S BARBARA	Asrar, G.	HQ-EE	Dozier, J.	NAGW 1265	2298
39	UNIV COLORADO-BOLDR	Wetzel, P. J.	GSFC	Grossman, R. L.	NAG 5-904	2437
39	UNIV COLORADO-BOLDR	Gardner, L. B.	MSFC	Sture, S.	NAS 8-35668	2528
39	UNIV COLORADO-BOLDR	Davis, B.	SSC	Hodgson, M. E.	NAG13-9	2514
39	UNIV COLORADO-BOLDR	Tuyahov, A. J.	HQ-EE	Chase, R.	NAGW 1191	2490
39	UNIV COLORADO-BOLDR	Butler, D. M.	HQ-EE	Byerly, R.	NAGW 1415	2499
39	UNIV COLORADO-BOLDR	Dodge, J. C.	HQ-EE	Chase, R. R.	NAGW 1754	2511
39	UNIV OF DELAWARE	Toll, D. L.	GSFC	Klemas, V.	NAG 5-915	2617

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39	UNIV OF DELAWARE	Wickland, D. E.	HQ-EE	Klemas, V.	NAGW 950	2621
39	UNIV OF DENVER	Seals, R. K., Jr.	LARC	Murcray, D. G.	NSG 1432	2581
39	UNIV OF FLORIDA	Uyahov, J. T.	HQ-EL	Ruth, B. E.	NSG 7236	2802
39	UNIV OF GEORGIA	Wickland, D. E.	HQ-EE	Teskey, R. O.	NAGW 1034	2918
39	UNIV OF GEORGIA	Wickland, D. E.	HQ-EE	Box, E. O.	NAGW 1338	2919
39	UNIV ILLINOIS-URBANA	Lin, F. N.	KSC	Chao, B. T.	NAS10-11153	3140
39	UNIV OF IOWA	Wales, R. O.	GSFC	Gurnett, D. A.	NAG 5-1093	3299
39	UNIV OF KANSAS	Levine, E.	GSFC	Gogineni, S. P.	NAG 5-912	3359
39	UNIV OF MAINE-ORONO	Hill, C. L.	SSC	Sadar, S. A.	NAS13-369	3439
39	UNIV MARYLAND-COL PK	Toll, D. L.	GSFC	Sellers, P. J.	NAG 5-892	3539
39	UNIV MARYLAND-COL PK	Choudhury, B.	GSFC	Goward, S. N.	NAG 5-903	3540
39	UNIV MARYLAND-COL PK	Levine, E.	GSFC	Sellers, P.	NAG 5-907	3541
39	UNIV MARYLAND-COL PK	Tucker, C. J.	GSFC	Justice, C. O.	NAG 5-942	3545
39	UNIV MARYLAND-COL PK	Wickland, D. E.	HQ-EE	Goward, S. N.	NAGW 1142	3579
39	UNIV MARYLAND-COL PK	Wickland, D. E.	HQ-EE	Goward, S. N.	NAGW 1152	3580
39	UNIV MARYLAND-COL PK	Asrar, G.	HQ-EE	Sellers, P.	NAGW 1269	3582
39	UNIV MARYLAND-COL PK	Mellot, M. M.	HQ-ES	Papadopoulos, K.	NAGW 81	3568
39	UNIV MARYLAND-COL PK	Tuyahov, A. J.	HQ-ET	Ragan, R. M.	NAGW 33	3567
39	UNIV MARYLAND-COL PK	Owens, F. C.	HQ-XE	Goward, S. N.	NGT 00-050-297	3625
39	UNIV MICH-ANN ARBOR	Andary, J. F.	GSFC	Volz, R. A.	NAG 5-1024	4009
39	UNIV MICH-ANN ARBOR	Tuyahov, A. J.	HQ-EE	Ulaby, F. T.	NAGW 733	4026
39	UNIV MICH-ANN ARBOR	Tuyahov, A. J.	HQ-EE	Ulaby, F. T.	NAGW 1101	4029
39	UNIV MICH-ANN ARBOR	Wickland, D. E.	HQ-EE	Dobson, M. C.	NAGW 1362	4034
39	UNIV MICH-ANN ARBOR	Wickland, D. E.	HQ-EE	Dobson, M. C.	NAGW 1367	4036
39	UNIV MICH-ANN ARBOR	Owens, F. C.	HQ-XE	Walker, J. C.	NGT 00-070-120	4087
39	U MINN-MNPLS-ST PAUL	Ranson, K. J.	GSFC	Bauer, M. E.	NAG 5-1009	4108
39	U MINN-MNPLS-ST PAUL	Huntress, W.	HQ-EE	Bauer, M. E.	NAGW 1431	4119
39	U MINN-MNPLS-ST PAUL	Owens, F. C.	HQ-LE	Bauer, M. E.	NGT 00-050-100	4131
39	UNIV OF MONTANA	Wickland, D. E.	HQ-EE	Running, S. W.	NAGW 952	4233
39	UNIV NEBRASKA-LINCLN	Toll, D.	GSFC	Verma, S. B.	NAG 5-890	4241
39	UNIV NEBRASKA-LINCLN	Toll, D. L.	GSFC	Blad, B. L.	NAG 5-894	4242
39	UNIV NEBRASKA-LINCLN	Camillo, P.	GSFC	Norman, J.	NAG 5-957	4244
39	UNIV NEBRASKA-LINCLN	Tuyahov, A. J.	HQ-EE	Norman, J. M.	NAGW 983	4245
39	UNIV NEBRASKA-LINCLN	Ruzek, M. J.	HQ-EE	Norman, J. M.	NAGW 1099	4246
39	UNIV NEW HAMP-DURHAM	Dodge, J. C.	HQ-EE	Moore, B. E.	NAGW 980	4292
39	UNIV NEW HAMP-DURHAM	Wickland, D. E.	HQ-EE	Aber, J. D.	NAGW 1145	4293
39	UNIV NEW HAMP-DURHAM	Wickland, D. E.	HQ-EE	Rock, B. N.	NAGW 1245	4294
39	UNIV N CAR-CHPL HILL	Averner, M. M.	HQ-EB	Martens, C. S.	NAGW 593	4825
39	UNIV N CAR-CHPL HILL	Averner, M.	HQ-EB	Martens, C.	NAGW 1455	4828
39	UNIV N CAR-CHPL HILL	Kurylo, M. J.	HQ-EE	Martens, C. S.	NAGW 834	4826
39	UNIV N CAR-CHPL HILL	Tuyahov, A. J.	HQ-EE	Walsh, S. J.	NAGW 926	4827
39	UNIV OF NORTH DAKOTA	Wickland, D. E.	HQ-EE	Lieberman, D.	NAGW 1033	4841
39	UNIV OF PENNSYLVANIA	Knott, W. M.	KSC	Brown, A.	NAG10-21	5388
39	U PUERTO RICO-MAYAGZ	Tuyahov, A. J.	HQ-EE	Gonzales-lagoo H, J. G.	NAGW 849	6472
39	UNIV OF RHODE ISLAND	Levine, E.	GSFC	Groffman, P.	NAG 5-1052	5449
39	UNIV SO CAROLINA-COL	Hill, C. L.	SSC	Jensen, J. R.	NAS13-358	5481
39	UNIV OF SO FLORIDA	Kurylo, M. J.	HQ-EE	Sackett, W. M.	NAGW 836	2827
39	UNIV TEXAS-AUSTIN	Frey, H.	GSFC	Tapley, B. D.	NAG 5-1118	5792
39	UNIV TEXAS-AUSTIN	Stachnik, R. V.	HQ-EZ	Shields, G.	NSG 7232	5856
39	UNIV TEXAS-EL PASO	Sebesta, P. D.	ARC	Riter, S.	NCA 2-350	5886
39	UNIV OF TORONTO	Asrar, G.	HQ-EE	Band, L. E.	NAGW 1234	6488
39	UNIV OF VIRGINIA	Smith, J. A.	GSFC	Shugart, H. H.	NAG 5-1018	6118
39	UNIV OF VIRGINIA	Kaufman, J. W.	MSFC	Colucci, S. J.	NAG 8-657	6123
39	UNIV OF VIRGINIA	Wickland, D. E.	HQ-EE	Shugart, H. H.	NAGW 947	6128
39	UNIV OF VIRGINIA	Owens, F. C.	HQ-XE	Galloway, J. N.	NGT 00-050-002	6139
39	UNIV OF VIRGINIA	Owens, F. C.	HQ-LE	Shugart, H. H.	NGT 00-050-102	6140
39	UNIV OF WASHINGTON	Toll, D. L.	GSFC	Fritschen, L. G.	NAG 5-901	6268
39	UNIV OF WASHINGTON	Pitts, D. E.	JSC	Tillman, J. E.	NAG 9-243	6282
39	UNIV OF WASHINGTON	Kurylo, M. J.	HQ-EE	Lilley, M. D.	NAGW 840	6289
39	UNIV OF WASHINGTON	Kurylo, M. J.	HQ-EE	Quay, P. D.	NAGW 844	6290

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39	UNIV WISC-MADISON	Wetzel, P. J.	GSFC	Eloranta, E. W.	NAG 5-902	6395
39	UNIV WISC-MADISON	Owens, F. C.	HQ-LE	Herman, G. F.	NGT 50-002-802	6455
39	UNIV WISC-MILWAUKEE	Kurylo, M. J.	HQ-EE	Lidstrom, M. E.	NAGW 839	6457
39	UNIV OF WYOMING	Owe, M.	GSFC	Kelly, R. D.	NAG 5-913	6465
39	UTAH STATE UNIV	Mellott, M. M.	HQ-ES	Schunk, R. W.	NAGW 77	5945
39	UTAH STATE UNIV	Mellott, M. M.	HQ-ES	Raitt, W. J.	NAGW 1817	5948
39	WASHINGTON ST UNIV	Oseroff, H.	GSFC	Frazier, B. E.	NAS 5-28758	6348
39	WASHINGTON UNIVERSITY	Knott, W. N.	KSC	Pickard, B.	NAG10-22	4207
39	WASHINGTON UNIVERSITY	Kaluzienski, L. J.	HQ-EZ	Katz, J.	NAGW 592	4200
39	WEST VIRGINIA UNIV	Kurylo, M. K.	HQ-EE	Lang, G. E.	NAGW 842	6359
39	YALE UNIVERSITY	Owens, F. C.	HQ-XE	Burch, W.	NGT 00-050-252	2608
41	AUSTRALIAN NAT UNIV	Anderson, G. Y.	LARC	Sandeman, R. J.	NAGW 1467	6482
41	ALABAMA A&M UNIV	Randall, J. L.	MSFC	Shipman, J. R.	NAG 8-42	1005
41	ALABAMA A&M UNIV	Randall, J. L.	MSFC	Ila, D.	NAG 8-127	1014
41	ARIZONA STATE UNIV	Maddalon, D. V.	LARC	Saric, W. S.	NAG 1-805	1226
41	ARIZONA STATE UNIV	Maddalon, D. V.	LARC	Reed, H. L.	NAG 1-874	1227
41	ARIZONA STATE UNIV	Dagenhart, J. R.	LARC	Saric, W. S.	NAG 1-937	1228
41	ARIZONA STATE UNIV	Bullard, R. E.	LERC	Schmidt, D. K.	NAG 3-998	1236
41	ARKANSAS STATE UNIV	Maddalon, D. V.	LARC	Reed, H. L.	NAG 1-731	1484
41	ARKANSAS STATE UNIV	Knox, C. E.	LARC	Scanlon, C. H.	NCC 1-124	1485
41	AUBURN UNIV-AUBURN	Guest, S. H.	MSFC	Cochran, J. E.	NAG 8-647	1029
41	BELOIT COLLEGE	Kalinowski, J. K.	GSFC	Schroeder, D. J.	NAS 5-29252	6363
41	BOSTON UNIVERSITY	Yates, E. C.	LARC	Morino, L.	NAG 1-934	3642
41	BROWN UNIVERSITY	Erlebacher, G.	LARC	Gottlieb, D.	NAG 1-703	5417
41	BROWN UNIVERSITY	Rice, E. J.	LERC	Liu, J. T.	NAG 3-673	5418
41	BROWN UNIVERSITY	Rice, E. J.	LERC	Liu, J. T.	NAG 3-1016	5419
41	CALIF INST OF TECH	Mansour, N.	ARC	Leonard, A.	NCA 2-90	1560
41	CALIF INST OF TECH	Schiff, L. B.	ARC	Culick, F. E.	NCC 2-309	1561
41	CALIF INST OF TECH	Gera, J.	ARC	Culick, F.	NCC 2-429	1562
41	CALIF INST OF TECH	Brenner, M. J.	ARC	Doyle, J. C.	NCC 2-477	1563
41	CALIF INST OF TECH	Anders, J. B.	LARC	Marble, F. E.	NAG 1-842	1495
41	CALIF INST OF TECH	Starnes, J. H.	LARC	Knauss, W. G.	NSG 1483	1583
41	CALIF INST OF TECH	Owens, F. C.	HQ-LE	Doyle, J. C.	NGT 00-050-093	1572
41	CAL POLY ST U-S LUIS	Totah, J. J.	ARC	Fitzpatrick, M.	NAG 2-375	1587
41	CAL POLY ST U-S LUIS	Johnson, S. A.	ARC	Carpenter, T. W.	NAG 2-559	1588
41	CAL POLY ST U-S LUIS	Magee, J. P.	ARC	Grimes, J. E.	NAS 2-10364	1589
41	CAL POLY ST U-S LUIS	Chaderjian, N. M.	ARC	Cummings, R.	NCA 2-212	1590
41	CAL POLY ST U-S LUIS	Corsiglia, V. R.	ARC	Hoffman, J. A.	NCC 2-226	1591
41	CAL POLY ST U-S LUIS	Gelhausen, P. A.	ARC	Hoffmann, J. A.	NCC 2-236	1592
41	CAL POLY ST U-S LUIS	Gong, L.	ARC	Hoffmann, J.	NCC 2-433	1593
41	CAL POLY ST U-S LUIS	Ray, R. J.	ARC	Carpenter, T. W.	NCC 2-467	1594
41	CAL POLY ST U-S LUIS	Ray, R. J.	ARC	Carpenter, T. W.	NCC 2-468	1595
41	CAL POLY ST U-S LUIS	Olson, L. E.	ARC	Hoffmann, J. A.	NCC 2-484	1596
41	CAL POLY ST U-S LUIS	Ray, R. J.	ARC	Carpenter, T. W.	NCC 2-533	1597
41	CAL POLY ST U-S LUIS	Ross, J. C.	ARC	Cummings, R. M.	NCC 2-536	1598
41	CAL POLY ST U-S LUIS	Schiff, L. B.	ARC	Cummings, R. M.	NCC 2-564	1599
41	CAL POLY ST U-S LUIS	Ray, R.	ARC	Carpenter, T. W.	NCC 2-586	1600
41	CAL POLY ST U-S LUIS	Arnaiz, H. H.	ARC	Sandlin, D. R.	NCC 2-620	1601
41	CAL STATE U-LG BEACH	Petersen, K. L.	ARC	Cebeci, T.	NAG 2-569	1606
41	CAL STATE U-LG BEACH	Bidwell, C.	LERC	Cebeci, T.	NAG 3-601	1608
41	CAL STATE U-LG BEACH	Bidwell, C. S.	LERC	Cebeci, T.	NAG 3-935	1609
41	CAL STATE U-LG BEACH	Bidwell, C. S.	LERC	Cebeci, T.	NAG 3-1050	1610
41	CARNEGIE-MELLON UNIV	Chyu, W. J.	ARC	Shih, T.	NAG 2-549	5225
41	CARNEGIE-MELLON UNIV	Nguyen, H. L.	LERC	Ramos, J. I.	NAG 3-689	5228
41	CARNEGIE-MELLON UNIV	Roelke, R. J.	LERC	Shih, T. I.	NAG 3-929	5230
41	CASE WESTERN RESERVE	Anders, J. B.	LARC	Reshotko, E.	NAG 1-856	4844
41	CASE WESTERN RESERVE	Hingst, W. R.	LERC	Greber, I.	NAG 3-61	4846
41	CASE WESTERN RESERVE	Fleming, D. P.	LERC	Adams, M. L.	NAG 3-331	4848
41	CASE WESTERN RESERVE	Hingst, W. R.	LERC	Greber, I.	NAG 3-520	4852
41	CASE WESTERN RESERVE	Bober, L. J.	LERC	Reshotko, E.	NAG 3-648	4856

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41	CASE WESTERN RESERVE	Lawrence, C.	LERC	Huckelbridge, A.	NAG 3-707	4864
41	CASE WESTERN RESERVE	Sockol, P. M.	LERC	Greber, I.	NAG 3-725	4865
41	CASE WESTERN RESERVE	Armstrong, E. S.	LERC	T'ien, J. S.	NAG 3-809	4874
41	CASE WESTERN RESERVE	Newman, F. A.	LERC	Resler, E. L.	NAG 3-931	4885
41	CASE WESTERN RESERVE	Povinelli, L. A.	LERC	Reshotko, E.	NCC 3-124	4920
41	CASE WESTERN RESERVE	Owens, F. C.	HQ-XE	Korczak, K.	NGT 00-050-140	4934
41	CITY COLLEGE OF N Y	Budhnell, D. M.	LARC	Johnson, J. A., III	NAG 1-377	4431
41	CLEVELAND STATE UNIV	Sockol, P. M.	LERC	Gorla, R. S.	NAG 3-548	4945
41	CLEVELAND STATE UNIV	Chamis, C. C.	LERC	Bellini, P.	NAG 3-550	4946
41	CLEVELAND STATE UNIV	Boyle, R. J.	LERC	Ibrahim, M. B.	NAG 3-748	4948
41	CLEVELAND STATE UNIV	Chun, K. S.	LERC	Ghorashi, B.	NAG 3-1010	4957
41	CLEVELAND STATE UNIV	Miner, R. V.	LERC	Tewari, S. N.	NCC 3-111	4982
41	COLORADO STATE UNIV	Erickson, L. L.	ARC	Prenter, P. M.	NAG 2-577	2382
41	CORNELL UNIVERSITY	Chyu, W. J.	ARC	Caughey, D. A.	NAG 2-373	4512
41	CORNELL UNIVERSITY	Kitaplioglu, C.	ARC	Lyrintzis, A.	NAG 2-588	4515
41	CORNELL UNIVERSITY	Erlebacher, G.	LARC	Lumley, J. L.	NAG 1-954	4509
41	CORNELL UNIVERSITY	Newman, F. A.	LERC	Moore, F. K.	NAG 3-349	4517
41	CORNELL UNIVERSITY	Chima, R. V.	LERC	Caughay, D. A.	NAG 3-645	4518
41	CORNELL UNIVERSITY	Newman, F. A.	LERC	Resler, E. L.	NAG 3-803	4520
41	CORNELL UNIVERSITY	Lawrence, C.	LERC	Abel, J. F.	NAG 3-1063	4522
41	CORNELL UNIVERSITY	Newman, F. A.	LERC	Resler, E. L.	NAG 3-1069	4523
41	CORNELL UNIVERSITY	Smith, C. A.	HQ-RF	George, A. R.	NAG 2-554	4514
41	DUKE UNIVERSITY	Stefko, G. L.	LERC	Dowell, E. H.	NAG 3-724	4755
41	EMBRY-RIDDLE AERO U	Credeur, L.	LARC	Lohr, G. W.	NCC 1-66	2710
41	FLORIDA ATLANTIC U	Farassat, F.	LARC	Glegg, S. A.	NAG 1-715	2721
41	FLORIDA STATE UNIV	Dunagan, S. E.	ARC	Krothapalli, A.	NAG 2-314	2733
41	FLORIDA STATE UNIV	Seiner, J. M.	LARC	Tam, C. K.	NAG 1-421	2731
41	FLORIDA STATE UNIV	Zang, T. A.	LARC	Kopriva, D. A.	NAG 1-862	2732
41	GEORGE WASHINGTON U	Gardner, J.	LARC	Liebowitz, H.	NAG 1-728	2656
41	GEORGE WASHINGTON U	Carden, H. D.	LARC	Noor, A. K.	NAG 1-730	2657
41	GEORGE WASHINGTON U	Starnes, J. H.	LARC	Liebowitz, H.	NAG 1-788	2659
41	GEORGE WASHINGTON U	Massenberg, S. E.	LARC	Wolfson, B. E.	NAS 1-18458	2671
41	GEORGE WASHINGTON U	Clark, L. R.	LARC	Liebowitz, H.	NCC 1-14	2676
41	GEORGE WASHINGTON U	Bright, R. T.	LARC	Liebowitz, H.	NCC 1-24	2677
41	GEORGE WASHINGTON U	Batterson, J. G.	LARC	Liebowitz, H.	NCC 1-29	2678
41	GEORGE WASHINGTON U	Massenberg, S. E.	LARC	Liebowitz, H.	NCC 1-47	2679
41	GEORGE WASHINGTON U	Robinson, M. P.	LARC	Liebowitz, H.	NGR 09-010-078	2682
41	GEORGE WASHINGTON U	Clark, L. R.	LARC	Liebowitz, H.	NGR 09-010-085	2683
41	GEORGE WASHINGTON U	Rostafinski, W.	LERC	Garris, C. A.	NAG 3-860	2662
41	GEORGE WASHINGTON U	Luidens, R. W.	LERC	Foa, J. V.	NAG 3-1001	2664
41	GEORGE WASHINGTON U	Luidens, R. W.	LERC	Foa, J. V.	NAG 3-1012	2665
41	GEORGE WASHINGTON U	Venneri, S. L.	HQ-RM	Noor, A. K.	NAGW 1164	2670
41	GEORGIA INST OF TECH	Kunz, D. L.	ARC	Peters, D. A.	NAG 2-462	2858
41	GEORGIA INST OF TECH	Cheng, V. H.	ARC	Menon, P. K.	NAG 2-463	2859
41	GEORGIA INST OF TECH	Decker, W. A.	ARC	Schrage, D. P.	NCA 2-159	2888
41	GEORGIA INST OF TECH	Atencio, A.	ARC	Schrage, D. P.	NCA 2-266	2889
41	GEORGIA INST OF TECH	Tung, C.	ARC	Wu, J. C.	NCA 2-398	2890
41	GEORGIA INST OF TECH	Duke, E. L.	ARC	Menon, P. K.	NCC 2-506	2892
41	GEORGIA INST OF TECH	Cheng, V. H.	ARC	Menon, P. K.	NCC 2-575	2893
41	GEORGIA INST OF TECH	Adelman, H. M.	LARC	Peters, D. A.	NAG 1-710	2846
41	GEORGIA INST OF TECH	Moerder, D. D.	LARC	Calise, A. J.	NAG 1-784	2847
41	GEORGIA INST OF TECH	Moerder, D. D.	LARC	Cazise, A. J.	NAG 1-922	2851
41	GEORGIA INST OF TECH	Moerder, D. D.	LARC	Cazise, A. J.	NAG 1-939	2852
41	GEORGIA INST OF TECH	Arbuckle, P. D.	LARC	Stallford, H. L.	NAG 1-959	2853
41	GEORGIA INST OF TECH	Kvaternik, R. G.	LARC	Hanagud, S.	NAG 1-1007	2854
41	GEORGIA INST OF TECH	Kvaternik, R. G.	LARC	Peters, D. A.	NAG 1-1027	2855
41	GEORGIA INST OF TECH	McMillin, M. L.	LARC	Roach, R. L.	NAG 1-1039	2856
41	GEORGIA INST OF TECH	Chamis, C. C.	LERC	Simitses, G. J.	NAG 3-534	2862
41	GEORGIA INST OF TECH	Stefko, G. L.	LERC	Sankar, L. N.	NAG 3-730	2863
41	GEORGIA INST OF TECH	Janetzke, D. C.	LERC	Kamat, M.	NAG 3-895	2865

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41	GEORGIA INST OF TECH	Vanco, M. R.	LERC	Ahuja, K. K.	NAG 3-1062	2868
41	GEORGIA INST OF TECH	Krejsa, E.	LERC	Ahuja, K. K.	NAG 3-1066	2869
41	GEORGIA INST OF TECH	Owens, F. C.	HQ-XE	Menon, P. K.	NGT 00-050-387	2898
41	HAMPTON UNIVERSITY	Northam, G. B.	LARC	Yates, C. L.	NAG 1-628	6000
41	HAMPTON UNIVERSITY	Harvey, W. D.	LARC	Ram, R. B.	NAG 1-904	6009
41	HAMPTON UNIVERSITY	Bergeron, H. P.	LARC	Armstrong, H. B.	NCC 1-125	6017
41	ILL INST OF TECH	Reardon, L. F.	ARC	Sciammarella, C. A.	NAG 2-547	2988
41	ILL INST OF TECH	Guy, R. W.	LARC	Acharya, M.	NAG 1-871	2987
41	IMPERIAL C SCI & TEC	Peake, D. J.	ARC	Bradshaw, P.	NAGW 581	6493
41	IOWA STATE UNIV	Olson, L. E.	ARC	James, W. D.	NAG 2-30	3263
41	IOWA STATE UNIV	Holst, T. L.	ARC	Vogel, J. M.	NCA 2-190	3281
41	IOWA STATE UNIV	Holst, T. L.	ARC	Wilson, L. N.	NCA 2-346	3282
41	IOWA STATE UNIV	Tung, C.	ARC	Rajagopalan, R. G.	NCA 2-443	3283
41	IOWA STATE UNIV	Steger, J. L.	ARC	Pletcher, R. H.	NCC 2-476	3285
41	IOWA STATE UNIV	Zorumski, W. E.	LARC	Inger, G. R.	NAG 1-984	3262
41	IOWA STATE UNIV	Strazisar, A. J.	LERC	Okiishi, T. H.	NAG 3-356	3266
41	IOWA STATE UNIV	Hathaway, M. D.	LERC	Okiishi, T. H.	NAG 3-917	3267
41	IOWA STATE UNIV	Reid, L.	LERC	Oklishi, T. H.	NAG 3-1075	3269
41	IOWA STATE UNIV	Owens, F. C.	HQ-XE	Pierson, B. L.	NGT 00-050-128	3286
41	IOWA STATE UNIV	Owens, F. C.	HQ-XE	Hindman, R. G.	NGT 00-050-441	3290
41	ISRAEL INST OF TECH	Wieseman, C. D.	LARC	Karpel, M.	NAGW 1708	6500
41	JOHNS HOPKINS UNIV	Kalinowski, J. K.	GSFC	Fastie, W. G.	NAS 5-29259	3480
41	JOHNS HOPKINS UNIV	Vitablano, D.	GSFC	Moos, W.	NAS 5-30403	3482
41	KANSAS STATE UNIV	Nguyen, L. T.	LARC	Downing, D. R.	NAG 1-777	3346
41	LEHIGH UNIVERSITY	Kumar, A.	LARC	Walker, J. D.	NAG 1-832	5261
41	LEHIGH UNIVERSITY	Simon, F.	LERC	Walker, J. D.	NAG 3-771	5263
41	MASS INST OF TECH	Johnson, W. R.	ARC	Widnall, S. E.	NAG 2-251	3726
41	MASS INST OF TECH	Stremel, P. M.	ARC	Drela, M.	NAG 2-421	3728
41	MASS INST OF TECH	Kidwell, G. H.	ARC	Drela, M.	NAG 2-478	3731
41	MASS INST OF TECH	Lau, B. H.	ARC	Ham, N. D.	NCC 2-366	3853
41	MASS INST OF TECH	Talbot, P. D.	ARC	Ham, N. D.	NCC 2-447	3854
41	MASS INST OF TECH	Montgomery, R. C.	LARC	Vandervelde, W. E.	NAG 1-126	3714
41	MASS INST OF TECH	Melson, N. D.	LARC	Murman, E. M.	NAG 1-507	3715
41	MASS INST OF TECH	Holmes, B. J.	LARC	Hansman, R. J.	NAG 1-690	3716
41	MASS INST OF TECH	Winston, M. M.	LARC	Kerrebrock, J. L.	NAG 1-836	3718
41	MASS INST OF TECH	Melson, N. D.	LARC	Murman, E. M.	NAG 1-855	3719
41	MASS INST OF TECH	Starnes, J. H.	LARC	Lagace, P. A.	NAG 1-991	3723
41	MASS INST OF TECH	Morrell, F. R.	LARC	Simpson, R. W.	NGL 22-009-640	3858
41	MASS INST OF TECH	Adamczyk, J. J.	LERC	Covert, E. E.	NAG 3-660	3734
41	MASS INST OF TECH	Potapczuk, M. G.	LERC	Hansman, R. J.	NAG 3-666	3735
41	MASS INST OF TECH	Chamis, C. C.	LERC	Mandell, J. F.	NAG 3-680	3736
41	MASS INST OF TECH	Schumann, L. F.	LERC	Epstein, A. H.	NAG 3-770	3740
41	MASS INST OF TECH	Meitner, P. L.	LERC	Tan, G. S.	NAG 3-772	3741
41	MASS INST OF TECH	Merrill, W. C.	LERC	Vander Velde, W. E.	NAG 3-819	3743
41	MASS INST OF TECH	Adamczyk, J. J.	LERC	Greitzer, E. M.	NAG 3-844	3744
41	MASS INST OF TECH	Reinmann, J. J.	LERC	Hansman, R. J.	NAG 3-927	3746
41	MASS INST OF TECH	Drummond, C.	LERC	Tan, C. S.	NAG 3-953	3747
41	MASS INST OF TECH	Strazisar, A. J.	LERC	Epstein, A. H.	NAG 3-1013	3748
41	MASS INST OF TECH	Schumann, L. F.	LERC	Jery, B.	NAG 3-1028	3749
41	MASS INST OF TECH	Goldstein, M. E.	LERC	Landahl, M. T.	NCC 3-117	3856
41	MASS INST OF TECH	Newman, F. A.	LERC	Greitzer, E. M.	NSG 3208	3880
41	MASS INST OF TECH	Bardos, R.	HQ-MO	Mar, S. W.	NASW 3904	3848
41	MICHIGAN TECH UNIV	Roelke, R. J.	LERC	Arici, O.	NAG 3-1017	3973
41	MISSISSIPPI STATE U	Strawa, A. W.	ARC	Koenig, K.	NCA 2-244	4161
41	MISSISSIPPI STATE U	Thames, F. C.	LARC	Whitfield, D. L.	NAG 1-226	4145
41	MISSISSIPPI STATE U	Hoyniak, D.	LERC	Whitfield, D. L.	NAG 3-767	4147
41	MISSISSIPPI STATE U	Sanz, J. M.	LERC	Whitfield, D.	NAG 3-869	4148
41	MISSISSIPPI STATE U	Stefko, G. L.	LERC	Whitfield, D. L.	NAG 3-983	4149
41	MISSISSIPPI STATE U	Owens, F. C.	HQ-XE	Thompson, J. F.	NGT 00-050-398	4162
41	MISSISSIPPI STATE U	Owens, F. C.	HQ-XE	Hall, K. R.	NGT 00-050-530	4163

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41	NEW MEX ST U-LAS CR	West, W. W.	GSFC	Lane, K.	NAS 5-28928	4397
41	NEW MEX ST U-LAS CR	Cannon, R.	GSFC	Unavailable	NAS 5-30105	4400
41	NEW MEX ST U-LAS CR	Smith, G. A.	GSFC	Pfeiffer, J.	NCC 5-40	4403
41	NEW YORK UNIVERSITY	Liu, C. H.	LARC	Ting, L.	NCC 1-58	4613
41	NO CAR A&T STATE U	Gatski, T. B.	LARC	Klimkowski, J. Z.	NAG 1-812	4772
41	NO CAROLINA STATE U	Strawa, A. W.	ARC	Dejarnette, F. R.	NCA 2-416	4807
41	NO CAROLINA STATE U	Green, M. J.	ARC	Dejarnette, F. R.	NCA 2-417	4808
41	NO CAROLINA STATE U	Harris, J. E.	LARC	Hassan, H. A.	NAG 1-244	4783
41	NO CAROLINA STATE U	Nemeth, M. P.	LARC	Klang, E. C.	NAG 1-917	4790
41	NO CAROLINA STATE U	Salas, M. D.	LARC	Hassan, H. A.	NCC 1-22	4809
41	NO CAROLINA STATE U	Schoonover, W. E., Jr.	LARC	Dejarnette, F. R.	NCC 1-46	4810
41	NO CAROLINA STATE U	Gloss, B. B.	LARC	Dejarnette, F. R.	NCC 1-98	4811
41	NO CAROLINA STATE U	Zoby, E. V.	LARC	Dejarnette, F. R.	NCC 1-100	4812
41	NO CAROLINA STATE U	Miller, C. G.	LARC	Griffith, W. C.	NCC 1-109	4813
41	NO CAROLINA STATE U	Sutton, K.	LARC	Hassan, H. A.	NCC 1-112	4814
41	NO CAROLINA STATE U	Rudy, D. H.	LARC	Dejarnette, F. R.	NCC 1-117	4816
41	NO CAROLINA STATE U	Jordan, F. L.	LARC	Perkins, J. N.	NCC 1-118	4817
41	NO CAROLINA STATE U	Johnson, J. L.	LARC	Perkins, J. N.	NCC 1-123	4818
41	NO CAROLINA STATE U	Erickson, W. D.	LARC	Perkins, J. N.	NCC 1-129	4819
41	NO CAROLINA STATE U	Krejsa, E. A.	LERC	Nagel, R. T.	NAG 3-855	4796
41	NORTHWESTERN UNIV	Chamis, C. C.	LERC	Daniel, I. M.	NAG 3-950	2997
41	OHIO STATE UNIV	Palmer, E. A.	ARC	Woods, D. D.	NCC 2-592	5057
41	OHIO STATE UNIV	Brandon, J. M.	LARC	Bragg, M. B.	NAG 1-641	5005
41	OHIO STATE UNIV	Potapczuk, M. G.	LERC	Bragg, M. B.	NAG 3-28	5011
41	OHIO STATE UNIV	Potapczuk, M. G.	LERC	Lee, J. D.	NAG 3-374	5013
41	OHIO STATE UNIV	Goldstein, M. E.	LERC	Bodonyi, R. J.	NAG 3-743	5017
41	OHIO STATE UNIV	Chamis, C. C.	LERC	Sarigul, N.	NAG 3-790	5022
41	OHIO STATE UNIV	Lezberg, E. A.	LERC	Lee, J. D.	NAG 3-985	5030
41	OHIO STATE UNIV	Coltrin, R. E.	LERC	Lee, J. D.	NAG 3-986	5031
41	OHIO STATE UNIV	Zaman, K. B.	LERC	Scott, J. N.	NAG 3-1035	5034
41	OHIO STATE UNIV	Krejsa, E. A.	LERC	Scott, J. N.	NAG 3-1058	5036
41	OHIO STATE UNIV	Oran, W. A.	HQ-IC	Bossler, J.	NAGW 973	5046
41	OHIO UNIVERSITY	Morrell, F. R.	LARC	Lilley, R. W.	NAG 1-816	5070
41	OLD DOMINION UNIV	Massenberg, S. E.	LARC	Tiwari, S. N.	NAG 1-363	6028
41	OLD DOMINION UNIV	Kumar, A.	LARC	Tiwari, S. N.	NAG 1-423	6029
41	OLD DOMINION UNIV	Anders, J. B.	LARC	Ash, R. L.	NAG 1-530	6032
41	OLD DOMINION UNIV	Salas, M. D.	LARC	Von Lavante, E.	NAG 1-633	6035
41	OLD DOMINION UNIV	Bland, S. R.	LARC	Kandil, O. A.	NAG 1-648	6036
41	OLD DOMINION UNIV	Stallings, R. L., Jr.	LARC	Baysal, O.	NAG 1-664	6037
41	OLD DOMINION UNIV	Boyden, R. P.	LARC	Britcher, C. P.	NAG 1-716	6039
41	OLD DOMINION UNIV	Price, D. B.	LARC	Hibey, J. L.	NAG 1-736	6041
41	OLD DOMINION UNIV	Erlebacher, G.	LARC	Lakin, W. D.	NAG 1-773	6044
41	OLD DOMINION UNIV	Mixson, J. S.	LARC	Mei, C.	NAG 1-838	6049
41	OLD DOMINION UNIV	Liu, C. H.	LARC	Kandil, O. A.	NAG 1-846	6050
41	OLD DOMINION UNIV	Pao, S. P.	LARC	Lakin, W. D.	NAG 1-881	6052
41	OLD DOMINION UNIV	Maddrea, G. L.	LARC	Kidd, C.	NAS 1-17993	6066
41	OLD DOMINION UNIV	Prior, E. D.	LARC	Wolfson, B. E.	NAS 1-18584	6067
41	OLD DOMINION UNIV	Smith Jr., R. E.	LARC	Tiwari, S. N.	NCC 1-68	6070
41	OLD DOMINION UNIV	Plentovich, E. B.	LARC	Baysal, O.	NCC 1-121	6075
41	PENN STATE U-UNIV PK	Bellavia, D.	ARC	Cimbala, J. M.	NAG 2-484	5289
41	PENN STATE U-UNIV PK	Horstman, C. C.	ARC	Settles, G. S.	NAG 2-565	5290
41	PENN STATE U-UNIV PK	Horstman, C. C.	ARC	Settles, G. S.	NAG 2-575	5291
41	PENN STATE U-UNIV PK	Horstman, C. C.	ARC	Settles, G. S.	NAG 2-592	5292
41	PENN STATE U-UNIV PK	Mehta, U. B.	ARC	Dulikravich, G. S.	NCA 2-100	5347
41	PENN STATE U-UNIV PK	Feiereisen, W. J.	ARC	Dulikravich, G. S.	NCA 2-120	5348
41	PENN STATE U-UNIV PK	Kwak, D.	ARC	Tarbell, J. M.	NCA 2-291	5351
41	PENN STATE U-UNIV PK	Deiwert, G. S.	ARC	Dulikravich, G. S.	NCA 2-402	5354
41	PENN STATE U-UNIV PK	Seiner, J. M.	LARC	Morris, P. J.	NAG 1-657	5278
41	PENN STATE U-UNIV PK	Somers, D. M.	LARC	Maughmer, M. D.	NAG 1-778	5279
41	PENN STATE U-UNIV PK	Shaughnessy, J. D.	LARC	Maughmer, M. D.	NAG 1-849	5280

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41	PENN STATE U-UNIV PK	Northam, G. B.	LARC	Settles, G. S.	NAG 1-872	5281
41	PENN STATE U-UNIV PK	Starnes, J. H.	LARC	Hahn, H. T.	NAG 1-982	5284
41	PENN STATE U-UNIV PK	Seiner, J. M.	LARC	Morris, P. J.	NAG 1-1047	5287
41	PENN STATE U-UNIV PK	Civinsras, K. C.	LERC	Lakshminarayana, B.	NAG 3-555	5295
41	PENN STATE U-UNIV PK	Penko, P. F.	LERC	Merkle, C. L.	NAG 3-1020	5303
41	PENN STATE U-UNIV PK	Sanger, N. L.	LERC	Deutsch, S.	NSG 3264	5372
41	PENN STATE U-UNIV PK	Sockol, P. M.	LERC	Lakshminarayana, B.	NSG 3266	5373
41	PENN STATE U-UNIV PK	Owens, F. C.	HQ-XE	Morris, P. J.	NGT 00-050-003	5358
41	PENN STATE U-UNIV PK	Owens, F. C.	HQ-XE	Dulikravich, G. S.	NGT 00-050-135	5359
41	PENN STATE U-UNIV PK	Owens, F. C.	HQ-XE	Maughmer, M. D.	NGT 00-050-341	5363
41	POLYTECHNIC U	Gallman, J. M.	ARC	Isom, M. P.	NCC 2-172	4620
41	PRINCETON UNIVERSITY	Hicks, R. M.	ARC	Jameson, A.	NAG 2-96	4319
41	PRINCETON UNIVERSITY	Jacklin, S. A.	ARC	McKillip, R. M.	NAG 2-415	4321
41	PRINCETON UNIVERSITY	Decker, W. A.	ARC	Curtiss, H. C.	NAG 2-561	4323
41	PRINCETON UNIVERSITY	Zang, T. A.	LARC	Nosenchuck, D. M.	NAG 1-494	4312
41	PRINCETON UNIVERSITY	Gnoffo, P. A.	LARC	Lam, S. H.	NAG 1-726	4313
41	PRINCETON UNIVERSITY	Hinton, D. A.	LARC	Stengel, R. F.	NAG 1-834	4314
41	PRINCETON UNIVERSITY	Moreder, D. D.	LARC	Mease, K. D.	NAG 1-907	4315
41	PRINCETON UNIVERSITY	Anders, J. B.	LARC	Bogdonoff, S. M.	NAG 1-961	4316
41	PRINCETON UNIVERSITY	Northam, G. B.	LARC	Miles, R. B.	NAG 1-1011	4317
41	PRINCETON UNIVERSITY	Wilson, J. C.	LARC	Curtiss, H. C.	NAG 1-1038	4318
41	PRINCETON UNIVERSITY	Blanchard, R. C.	LARC	Cheng, S. I.	NAS 1-17234	4348
41	PRINCETON UNIVERSITY	Dwyer, D. L.	LARC	Bogdonoff, S. M.	NCC 1-131	4354
41	PRINCETON UNIVERSITY	Morrell, F. R.	LARC	Stengel, R. F.	NGL 31-001-252	4357
41	PRINCETON UNIVERSITY	Porro, A. R.	LERC	Bogdonoff, S. M.	NAG 3-926	4327
41	PRINCETON UNIVERSITY	Hingst, W. R.	LERC	Smits, A. J.	NAG 3-1022	4329
41	PRINCETON UNIVERSITY	Wang, C. R.	LERC	Smith, A. J.	NAG 3-1032	4330
41	PRINCETON UNIVERSITY	Owens, F. C.	HQ-XE	Jahn, R. G.	NGT 00-070-146	4363
41	PURDUE UNIVERSITY	Berry, D. T.	ARC	Schmidt, D. K.	NAG 4-1	3214
41	PURDUE UNIVERSITY	Silcox, R. J.	LARC	Bernhard, R. J.	NAG 1-58	3189
41	PURDUE UNIVERSITY	Perry, B.	LARC	Weisshaar, T. A.	NAG 1-157	3190
41	PURDUE UNIVERSITY	Edwards, J. W.	LARC	Yang, H. T.	NAG 1-372	3191
41	PURDUE UNIVERSITY	Arbuckle, P. D.	LARC	Schmidt, D. K.	NAG 1-758	3194
41	PURDUE UNIVERSITY	Armstrong, E. S.	LARC	Skelton, R. E.	NAG 1-857	3197
41	PURDUE UNIVERSITY	Steinke, R. J.	LERC	Murthy, S. N.	NAG 3-481	3201
41	PURDUE UNIVERSITY	Stefko, G. L.	LERC	Williams, M. H.	NAG 3-499	3202
41	PURDUE UNIVERSITY	Hoyniak, D.	LERC	Fleeter, P. S.	NAG 3-656	3205
41	PURDUE UNIVERSITY	Newman, F. A.	LERC	Fleeter, S.	NAG 3-825	3206
41	PURDUE UNIVERSITY	Adamczyk, J. J.	LERC	Usab, W. J.	NAG 3-875	3209
41	PURDUE UNIVERSITY	Holdeman, J. D.	LERC	Sullivan, J. P.	NAG 3-943	3210
41	PURDUE UNIVERSITY	Miller, C. J.	LERC	Sullivan, J. P.	NSG 3135	3244
41	PURDUE UNIVERSITY	Schumann, L.	LERC	Fleeter, S.	NSG 3285	3245
41	PURDUE UNIVERSITY	Owens, F. C.	HQ-XE	Yang, H. T.	NGT 00-050-406	3241
41	PURDUE UNIVERSITY	Owens, F. C.	HQ-XE	Longuski, J.	NGT 00-050-499	3242
41	PURDUE UNIVERSITY	Owens, F. C.	HQ-LE	Grandt, A. F., Jr.	NGT 00-050-006	3233
41	PURDUE UNIVERSITY	Owens, F. C.	HQ-LE	Howell, K. C.	NGT 00-050-053	3235
41	PURDUE UNIVERSITY	Owens, F. C.	HQ-LE	Andrisani, D.	NGT 00-050-072	3237
41	RENSSELAER POLY-NY	Mulville, D.	HQ	Loewy, R. G.	NGL 33-018-003	4646
41	RENSSELAER POLY-NY	Kvaternik, R. G.	LARC	Bielawa, R.	NAG 1-807	4624
41	RENSSELAER POLY-NY	Kvaternik, R. G.	LARC	Bauchau, O. A.	NAG 1-1018	4627
41	RENSSELAER POLY-NY	Adamczyk, J. J.	LERC	Mayle, R. E.	NAG 3-810	4632
41	RENSSELAER POLY-NY	Luidems, R. W.	LERC	Myrabo, L. N.	NAG 3-916	4633
41	RICE UNIVERSITY	Price, C.	JSC	De Figueiredo, R.	NAG 9-208	5588
41	RICE UNIVERSITY	Bowles, R. L.	LARC	Miele, A.	NAG 1-516	5574
41	RICE UNIVERSITY	Burrows, R. R.	MSFC	Miele, A.	NAG 8-755	5583
41	SAN DIEGO STATE UNIV	Olson, L. E.	ARC	Katz, J.	NCC 2-458	1632
41	SAN DIEGO STATE UNIV	Olson, L. E.	ARC	Katz, J.	NCC 2-596	1633
41	SAN JOSE STATE UNIV	Lasher, L. E.	ARC	Desautel, D.	NAG 2-363	1642
41	SAN JOSE STATE UNIV	Tauber, M. E.	ARC	Desautel, D.	NAG 2-457	1644
41	SAN JOSE STATE UNIV	Davis, T. J.	ARC	Nedell, W. F.	NAG 2-537	1645

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41	SAN JOSE STATE UNIV	Talbot, P. D.	ARC	Wang, J. C.	NCC 2-267	1667
41	SAN JOSE STATE UNIV	Lasher, L. E.	ARC	Desautel, D.	NCC 2-412	1671
41	SAN JOSE STATE UNIV	Deiwert, G. S.	ARC	Borja, A. A.	NCC 2-430	1672
41	STANFORD UNIVERSITY	Erzberger, H.	ARC	Bryson, A. E.	NAG 2-191	1697
41	STANFORD UNIVERSITY	Watson, V. R.	ARC	Hesselink, L.	NAG 2-489	1702
41	STANFORD UNIVERSITY	Viegas, J. R.	ARC	MacCormack, R. W.	NCA 2-40	1757
41	STANFORD UNIVERSITY	Feiereisen, W.	ARC	Baganoff, D.	NCA 2-116	1759
41	STANFORD UNIVERSITY	Pulliam, T. H.	ARC	Spreiter, J. R.	NCA 2-168	1761
41	STANFORD UNIVERSITY	Spalart, P.	ARC	Cantwell, B. J.	NCA 2-183	1762
41	STANFORD UNIVERSITY	Deiwert, G. S.	ARC	MacCormack, R. W.	NCA 2-243	1766
41	STANFORD UNIVERSITY	Viegas, J. R.	ARC	MacCormack, R. W.	NCA 2-259	1768
41	STANFORD UNIVERSITY	Smith, S. C.	ARC	Kroo, I.	NCA 2-271	1772
41	STANFORD UNIVERSITY	Margason, R. J.	ARC	Ashley, H.	NCA 2-287	1776
41	STANFORD UNIVERSITY	Nelson, H. G.	ARC	Springer, G. S.	NCA 2-311	1779
41	STANFORD UNIVERSITY	Deiwert, G. S.	ARC	Baganoff, D.	NCA 2-313	1780
41	STANFORD UNIVERSITY	Yu, Y. H.	ARC	Bershader, D.	NCA 2-339	1785
41	STANFORD UNIVERSITY	Mehta, U.	ARC	Kroo, I.	NCA 2-343	1786
41	STANFORD UNIVERSITY	Pulliam, T. H.	ARC	Spreiter, J. R.	NCA 2-361	1789
41	STANFORD UNIVERSITY	Schiff, L. B.	ARC	Hesselink, L.	NCA 2-363	1790
41	STANFORD UNIVERSITY	Tauber, M. E.	ARC	Chang, I. D.	NCA 2-378	1791
41	STANFORD UNIVERSITY	Sharma, S. P.	ARC	Bershader, D.	NCA 2-425	1796
41	STANFORD UNIVERSITY	Kwak, D.	ARC	Chang, I. D.	NCA 2-431	1797
41	STANFORD UNIVERSITY	Deiwert, G. S.	ARC	MacCormack, R. W.	NCA 2-437	1799
41	STANFORD UNIVERSITY	Lomax, H.	ARC	Kroo, I.	NCA 2-447	1801
41	STANFORD UNIVERSITY	Edenborough, H. K.	ARC	Roberts, L.	NCC 2-55	1802
41	STANFORD UNIVERSITY	Hilbert, K. B.	ARC	Bryson, A. E., Jr.	NCC 2-106	1803
41	STANFORD UNIVERSITY	Murphy, J.	ARC	Roberts, L.	NCC 2-326	1808
41	STANFORD UNIVERSITY	Smith, S. C.	ARC	Kroo, I. B.	NCC 2-384	1810
41	STANFORD UNIVERSITY	Erickson, L. E.	ARC	Roberts, L.	NCC 2-390	1812
41	STANFORD UNIVERSITY	Viegas, J. R.	ARC	Roberts, L.	NCC 2-532	1820
41	STANFORD UNIVERSITY	Holst, T. L.	ARC	Roberts, L.	NCC 2-543	1822
41	STANFORD UNIVERSITY	Chapman, G. T.	ARC	Hanson, R. K.	NCC 2-547	1823
41	STANFORD UNIVERSITY	Baker, F. A.	ARC	Bershader, D.	NCC 2-549	1824
41	STANFORD UNIVERSITY	Coakley, T. J.	ARC	Bradshaw, P.	NCC 2-610	1826
41	STANFORD UNIVERSITY	Vitagliano, D.	GSFC	Timothy, J. G.	NAS 5-29389	1748
41	STANFORD UNIVERSITY	Rogers, J. L.	LARC	Kroo, I.	NAG 1-1052	1696
41	STANFORD UNIVERSITY	Doggett, R. V., Jr.	LARC	Ashley, H.	NGL 05-020-243	1834
41	STANFORD UNIVERSITY	Fishbach, L. H.	LERC	Breakwell, J. V.	NAG 3-908	1707
41	STANFORD UNIVERSITY	Owens, F. C.	HQ-XE	Bryson, A. E.	NGT 00-050-359	1846
41	STANFORD UNIVERSITY	Owens, F. C.	HQ-XE	Bershader, D.	NGT 00-050-389	1849
41	STANFORD UNIVERSITY	Owens, F. C.	HQ-XE	MacCormack, R. W.	NGT 00-070-078	1856
41	STANFORD UNIVERSITY	Owens, F. C.	HQ-XE	Banks, P. M.	NGT 00-070-116	1857
41	STANFORD UNIVERSITY	Owens, F. C.	HQ-LE	Banks, P. M.	NGT 00-070-016	1854
41	STATE UNIV NY-BUFFAL	Horner, G. C.	LARC	Inman, D. J.	NAG 1-785	4686
41	STATE UNIV NY-BUFFAL	Adamczyk, J. J.	LERC	Taulbee, D. B.	NAG 3-962	4692
41	STATE UNIV NY-BUFFAL	Claus, R. W.	LERC	Givi, P.	NAG 3-1011	4693
41	STATE UNIV NY-BUFFAL	Owens, F. C.	HQ-XE	Inman, D. J.	NGT 00-070-030	4700
41	STATE UNIV NY-BUFFAL	Owens, F. C.	HQ-XE	Mook, D. J.	NGT 00-070-031	4701
41	STATE U NY-STONY BRK	Owens, F. C.	HQ-LE	Inman, D. J.	NGT 33-183-804	4728
41	SYRACUSE UNIVERSITY	Peterson, R.	ARC	Murthy, V. R.	NAG 2-306	4737
41	SYRACUSE UNIVERSITY	Yeager, W. T.	LARC	Murthy, V. R.	NAG 1-759	4735
41	SYRACUSE UNIVERSITY	O'Brien, J. E.	LERC	Bogucz, E. A.	NAG 3-1051	4740
41	TEXAS A&M UNIV SYSTM	Yates, E. C.	LARC	Carlson, L. A.	NAG 1-793	5620
41	TENNESSEE STATE UNIV	Harwell, R.	MSFC	Olson, L. H.	NAG 8-22	5497
41	TEXAS A&M UNIVERSITY	Shockey, G. A.	ARC	Hall, G. F.	NCC 2-260	5681
41	TEXAS A&M UNIVERSITY	Holder, B. W.	JSC	Allen, D. H.	NAG 9-140	5648
41	TEXAS A&M UNIVERSITY	Whitnah, M. A.	JSC	Ward, D. T.	NAG 9-148	5650
41	TEXAS A&M UNIVERSITY	Li, C.	JSC	Anderson, D. A.	NAG 9-194	5655
41	TEXAS A&M UNIVERSITY	Fitzgerald, S.	JSC	Thomas, R. E.	NAG 9-386	5668
41	TEXAS A&M UNIVERSITY	Campbell, R. L.	LARC	Carlson, L. A.	NAG 1-619	5625

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41	TEXAS A&M UNIVERSITY	Seiner, J. M.	LARC	Morrison, G. L.	NAG 1-630	5626
41	TEXAS A&M UNIVERSITY	Hinton, D. A.	LARC	Ward, D. T.	NAG 1-781	5630
41	TEXAS A&M UNIVERSITY	Weidner, J. P.	LARC	Lu, F. K.	NAG 1-891	5631
41	TEXAS A&M UNIVERSITY	Hinton, D. A.	LARC	Ward, D. T.	NAG 1-916	5633
41	TEXAS A&M UNIVERSITY	Hartung, L. C.	LARC	Carlson, L. A.	NAG 1-1003	5635
41	TEXAS A&M UNIVERSITY	Dittmar, J. H.	LERC	Korkan, K. D.	NAG 3-354	5638
41	TEXAS A&M UNIVERSITY	Reinmann, J. J.	LERC	Korkan, K. D.	NAG 3-626	5639
41	TEXAS A&M UNIVERSITY	Miller, T. L.	LERC	Korkan, K. D.	NCC 3-132	5683
41	TEXAS A&M UNIVERSITY	Cannon, J.	MSFC	Childs, W.	NAS 8-37821	5678
41	TEXAS A&M UNIVERSITY	Owens, F. C.	HQ-XE	Ostowari, C.	NGT 00-050-221	5686
41	TEXAS A&M UNIVERSITY	Owens, F. C.	HQ-XE	Allen, D. H.	NGT 00-050-262	5689
41	TEXAS A&M UNIVERSITY	Owens, F. C.	HQ-XE	Carlson, L.	NGT 00-050-381	5691
41	TEXAS A&M UNIVERSITY	Owens, F. C.	HQ-LE	Carlson, L. A.	NGT 00-050-114	5684
41	TEXAS A&M UNIVERSITY	Owens, F. C.	HQ-LE	Schapery, R. A.	NGT 44-001-804	5700
41	TUSKEGEE UNIVERSITY	Randall, J. L.	MSFC	Ray, P. K.	NAG 8-20	1061
41	UNIV OF AKRON	Chamis, C. C.	LERC	Fertis, D. G.	NAG 3-50	5080
41	UNIV OF AKRON	Arnold, S. M.	LERC	Robinson, D. N.	NAG 3-379	5083
41	UNIV OF AKRON	Olsen, W.	LERC	Scavuzzo, R. J.	NAG 3-479	5084
41	UNIV OF AKRON	De Anva, R. G.	LERC	Drummond, J. E.	NAG 3-531	5085
41	UNIV OF AKRON	Chamis, C. C.	LERC	Padovan, J.	NAG 3-664	5087
41	UNIV OF AKRON	Krosel, S.	LERC	Hartley, T. T.	NAG 3-778	5089
41	UNIV OF AKRON	Arnold, S. M.	LERC	Tan, H. Q.	NAG 3-872	5091
41	UNIV OF AKRON	Arnold, S. M.	LERC	Chang, T. P.	NAG 3-901	5093
41	UNIV OF AKRON	Melcher, K. J.	LERC	Hartley, T. T.	NAG 3-904	5094
41	UNIV OF AKRON	Merrill, W. C.	LERC	Garcia, J. A.	NAG 3-1031	5098
41	UNIV ALA-HUNTSVILLE	Scudder, J. D.	GSFC	Torbert, R. B.	NAG 5-986	1091
41	UNIV ALA-HUNTSVILLE	Fields, S. A.	MSFC	Torr, D. G.	NAG 8-100	1108
41	UNIV ALA-UNIVERSITY	Waites, H.	MSFC	Hsia, W. S.	NAG 8-81	1194
41	UNIV OF ARIZONA	Wingrove, R. C.	ARC	Parks, E. K.	NCC 2-329	1433
41	UNIV OF ARIZONA	Sours, W. P.	GSFC	Thompson, R. I.	NAS 5-30008	1420
41	UNIV OF ARIZONA	Groeneweg, J. F.	LERC	Kerschen, E. J.	NAG 3-357	1301
41	UNIV OF ARIZONA	Miles, J.	LERC	Peterson, R. A.	NAG 3-460	1303
41	UNIV OF ARIZONA	Miles, J. H.	LERC	Balsa, T.	NAG 3-781	1306
41	UNIV OF ARIZONA	Clayton, G.	HQ-EZ	Carone, T. E.	NAGW 1820	1416
41	UNIV OF ARIZONA	Owens, F. C.	HQ-XE	Ramohalli, K.	NGT 00-070-071	1466
41	UNIV OF ARIZONA	Owens, F. C.	HQ-XE	Ramohalli, K.	NGT 00-070-140	1467
41	UNIV OF ARIZONA	Owens, F. C.	HQ-LE	Fasel, H.	NGT 00-050-074	1448
41	UNIV OF ARIZONA	Owens, F. C.	HQ-LE	Glezer, A.	NGT 00-050-076	1449
41	UNIV OF BRIDGEPORT	Kvaternik, R. G.	LARC	Ojalvo, I. U.	NAG 1-1033	2585
41	UNIV CALIF-BERKELEY	Davis, S.	ARC	Corcos, G. M.	NAG 2-378	1865
41	UNIV CALIF-BERKELEY	Deiwert, G. S.	ARC	Hurlbut, F. C.	NCA 2-342	1954
41	UNIV CALIF-BERKELEY	Flores, J.	ARC	Cheer, A. Y.	NCC 2-626	1966
41	UNIV CALIF-BERKELEY	Strawa, A. W.	ARC	Holt, M.	NCC 2-635	1967
41	UNIV CALIF-BERKELEY	Wood, G. M.	LARC	Hurlbut, F. C.	NAG 1-879	1861
41	UNIV CALIF-DAVIS	Cheng, V. H.	ARC	Hess, R. A.	NAG 2-221	2000
41	UNIV CALIF-DAVIS	Bray, R. S.	ARC	Hess, R. A.	NAG 2-482	2005
41	UNIV CALIF-DAVIS	Berry, D. T.	ARC	Hess, R. A.	NAG 2-490	2006
41	UNIV CALIF-DAVIS	Green, M.	ARC	Hafez, M. M.	NCA 2-383	2025
41	UNIV CALIF-DAVIS	Chang, I. C.	ARC	Van Dam, C. P.	NCA 2-397	2026
41	UNIV CALIF-DAVIS	Rubesin, M. W.	ARC	Kollmann, W.	NCC 2-186	2032
41	UNIV CALIF-DAVIS	Lebacqz, J. V.	ARC	Hess, R. A.	NCC 2-624	2038
41	UNIV CALIF-DAVIS	Salas, M. D.	LARC	Hafez, M. M.	NAG 1-669	1999
41	UNIV CALIF-DAVIS	Claus, R. W.	LERC	Kollman, W.	NAG 3-836	2010
41	UNIV CALIF-IRVINE	Wentzel, B.	ARC	Blanks, R.	NAS 2-12834	2052
41	UNIV CALIF-IRVINE	Tacina, R. R.	LERC	Samuelsen, G. S.	NAG 3-1042	2047
41	UNIV CALIF-L ANGELES	Iliff, K. W.	ARC	Balakrishnan, A. V.	NSG 4015	2160
41	UNIV CALIF-L ANGELES	Duke, E. L.	ARC	Levan, N.	NAG 2-441	2064
41	UNIV CALIF-L ANGELES	Jacklin, S. A.	ARC	Friedmann, P.	NAG 2-477	2066
41	UNIV CALIF-L ANGELES	Soderman, P. T.	ARC	Meecham, W. C.	NCC 2-584	2146
41	UNIV CALIF-L ANGELES	Soderman, P.	ARC	Meecham, W. C.	NSG 2290	2159

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41	UNIV CALIF-L ANGELES	MacAraeg, M. G.	LARC	Osher, S. J.	NAG 1-270	2058
41	UNIV CALIF-L ANGELES	Adelman, H. M.	LARC	Friedmann, P. P.	NAG 1-833	2060
41	UNIV CALIF-L ANGELES	Owens, F. C.	HQ-XE	Friedmann, P. P.	NGT 00-050-444	2152
41	UNIV CALIF-SAN DIEGO	Kufeld, R. M.	ARC	Seible, F.	NCC 2-598	2248
41	UNIV CALIF-SAN DIEGO	Kalinowski, J. K.	GSFC	Baity, W.	NAS 5-29293	2235
41	UNIV CALIF-S BARBARA	Sobieski, J.	LARC	Vanderplaats, G. N.	NAG 1-567	2283
41	UNIV OF CINCINNATI	Davis, T. J.	ARC	Slater, G. L.	NAG 2-175	5112
41	UNIV OF CINCINNATI	Compton, W. B.	LARC	Rubin, S. G.	NAG 1-8	5108
41	UNIV OF CINCINNATI	Liu, C. H.	LARC	Ghia, K. N.	NAG 1-753	5109
41	UNIV OF CINCINNATI	Adamczyk, J. J.	LERC	Rubin, S. G.	NAG 3-397	5113
41	UNIV OF CINCINNATI	Benson, T. J.	LERC	Rubin, S. G.	NAG 3-716	5116
41	UNIV OF CINCINNATI	Coleman, A. D.	MSFC	Rost, R.	NAS 8-34503	5125
41	UNIV OF CINCINNATI	Owens, F. C.	HQ-LE	Ghia, K. N.	NGT 00-070-007	5132
41	UNIV COLORADO-BOLDR	Vandalsem, W. R.	ARC	Dougherty, F. C.	NCA 2-219	2532
41	UNIV COLORADO-BOLDR	Van Dalsem, W. R.	ARC	Dougherty, F. C.	NCA 2-336	2533
41	UNIV COLORADO-BOLDR	MacElroy, R. D.	ARC	Luttges, M. W.	NCA 2-367	2534
41	UNIV COLORADO-BOLDR	Flores, J.	ARC	Chow, C. Y.	NCC 2-440	2536
41	UNIV COLORADO-BOLDR	Chapman, G. T.	ARC	Dougherty, F. C.	NCC 2-473	2537
41	UNIV COLORADO-BOLDR	Chang, I. C.	ARC	Chow, C. Y.	NCC 2-508	2538
41	UNIV COLORADO-BOLDR	Stortz, M. W.	ARC	Chow, C. Y.	NCC 2-630	2539
41	UNIV COLORADO-BOLDR	Mandl, D. J.	GSFC	Hansen, E. R.	NAS 5-30067	2522
41	UNIV COLORADO-BOLDR	Maestrello, L.	LARC	Freyruth, P.	NAG 1-769	2406
41	UNIV COLORADO-BOLDR	Harvey, W. D.	LARC	Biringer, S.	NAG 1-798	2407
41	UNIV COLORADO-BOLDR	Bauer, S. X.	LARC	Sobieczky, H.	NAG 1-880	2408
41	UNIV COLORADO-BOLDR	Chamis, C. C.	LERC	Felippa, C. A.	NAG 3-934	2413
41	UNIV COLORADO-BOLDR	Owens, F. C.	HQ-XE	Dougherty, F. C.	NGT 00-050-164	2544
41	UNIV COLORADO-BOLDR	Owens, F. C.	HQ-XE	Born, G. H.	NGT 00-050-246	2546
41	UNIV COLORADO-BOLDR	Owens, F. C.	HQ-XE	Rosborough, G. W.	NGT 00-050-329	2550
41	UNIV COLORADO-BOLDR	Owens, F. C.	HQ-XE	Born, G. H.	NGT 00-050-336	2551
41	UNIV COLORADO-BOLDR	Owens, F. C.	HQ-XE	Luttges, M. W.	NGT 00-070-089	2561
41	UNIV COLORADO-BOLDR	Owens, F. C.	HQ-LE	Born, G. H.	NGT 00-050-030	2541
41	UNIV COLORADO-BOLDR	Owens, F. C.	HQ-LE	Culp, R. D.	NGT 00-050-067	2543
41	UNIV OF CONNECTICUT	Thompson, R. L.	LERC	Jordan, E.	NAG 3-512	2587
41	UNIV OF CONNECTICUT	Thompson, R. L.	LERC	Jordan, E. H.	NAG 3-882	2589
41	UNIV OF DAYTON	Stone, J. R.	LERC	Scott, J. N.	NAG 3-526	5138
41	UNIV OF DAYTON	Potapczuk, M. G.	LERC	Scott, J. N.	NAG 3-665	5139
41	UNIV OF DAYTON	Owens, F. C.	HQ-XE	Fraker, J. R.	NGT 00-050-082	5141
41	UNIV OF DELAWARE	Gyekenyesi, J. P.	LERC	Chou, T. W.	NAS 3-25791	2629
41	UNIV OF FLORIDA	Chyu, W. J.	ARC	Hsu, C. C.	NAG 2-473	2774
41	UNIV OF FLORIDA	Chapman, G. T.	ARC	Clarkson, M. H.	NCA 2-214	2795
41	UNIV OF FLORIDA	Aoyagi, K.	ARC	Fearn, R. L.	NCC 2-403	2798
41	UNIV OF FLORIDA	Sobieski, J.	LARC	Hajela, P.	NAG 1-850	2771
41	UNIV OF FLORIDA	Sobieski, J.	LARC	Hajela, P.	NAG 1-1004	2772
41	UNIV OF FLORIDA	Weston, R. P.	LARC	Fearn, R. L.	NCC 1-132	2797
41	UNIV OF FLORIDA	Roelke, R. J.	LERC	Shih, T. I.	NAG 3-828	2776
41	UNIV OF FLORIDA	Reinmann, J. J.	LERC	Yih, C. S.	NAG 3-874	2777
41	UNIV OF HAWAII-MANOA	Sours, W. P.	GSFC	Hall, D. N.	NAS 5-30021	2967
41	UNIV HOUSTON-HOUSTON	Kim, J.	ARC	Hussain, A. K.	NCA 2-317	5742
41	UNIV HOUSTON-HOUSTON	Bland, D. A.	JSC	Witte, L. C.	NAG 9-389	5735
41	UNIV HOUSTON-HOUSTON	Rice, E.	LERC	Hussain, A. K.	NAG 3-639	5711
41	UNIV ILLINOIS-URBANA	Erickson, L. L.	ARC	Lee, K. D.	NCA 2-92	3141
41	UNIV ILLINOIS-URBANA	Woo, A.	ARC	Lee, S. W.	NCA 2-433	3146
41	UNIV ILLINOIS-URBANA	Sewall, W. G.	LARC	Chow, W. L.	NAG 1-677	3108
41	UNIV ILLINOIS-URBANA	Holdeman, J. D.	LERC	Vanka, S. P.	NAG 3-1026	3124
41	UNIV ILLINOIS-URBANA	Choo, Y. K.	LERC	Lee, K. D.	NAG 3-1074	3126
41	UNIV ILLINOIS-URBANA	Owens, F. C.	HQ-XE	Beddini, R. A.	NGT 00-050-363	3157
41	UNIV OF KANSAS	Stroub, R. H.	ARC	Lan, C. E.	NCC 2-175	3368
41	UNIV OF KANSAS	Stroub, R. H.	ARC	Fortin, P. E.	NCC 2-351	3369
41	UNIV OF KANSAS	Felker, F. F.	ARC	Van Aken, J. M.	NCC 2-417	3370
41	UNIV OF KANSAS	Gera, J.	ARC	Downing, D. R.	NCC 2-588	3371

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41	UNIV OF KANSAS	Lebacqz, J. V.	ARC	Downing, D. R.	NCC 2-612	3372
41	UNIV OF KANSAS	Williams, L. J.	LARC	Roskan, J.	NAG 1-345	3351
41	UNIV OF KANSAS	Krist, S.	LARC	Lan, C. E.	NAG 1-837	3353
41	UNIV OF KANSAS	Farassat, F.	LARC	Farokhi, S.	NAG 1-867	3354
41	UNIV OF KANSAS	Towne, C. E.	LERC	Farokhi, S.	NAG 3-841	3357
41	UNIV OF KANSAS	Rice, E. J.	LERC	Farokhi, S.	NCC 3-56	3373
41	UNIV OF MAINE-ORONO	Nguyen, H. L.	LERC	Winowich, N. S.	NAG 3-1033	3436
41	UNIV MARYLAND-COL PK	Graham, T. A.	ARC	Chopra, I.	NAG 2-409	3517
41	UNIV MARYLAND-COL PK	Deiwert, G. S.	ARC	Anderson, J. D.	NAG 2-529	3518
41	UNIV MARYLAND-COL PK	Wainscott, F.	GSFC	Gloeckler, S.	NAS 5-30370	3595
41	UNIV MARYLAND-COL PK	Mantay, W. R.	LARC	Chopra, I.	NAG 1-375	3508
41	UNIV MARYLAND-COL PK	Gnoffo, P. A.	LARC	Anderson, J. D.	NAG 1-620	3509
41	UNIV MARYLAND-COL PK	Nemeth, M. P.	LARC	Hyer, M. W.	NAG 1-665	3510
41	UNIV MARYLAND-COL PK	Dicarolo, D. J.	LARC	Winkelmann, A. E.	NAG 1-681	3511
41	UNIV MARYLAND-COL PK	Walsh, J. L.	LARC	Chopra, I.	NAG 1-739	3512
41	UNIV MARYLAND-COL PK	Nixon, M. W.	LARC	Chodra, I.	NAG 1-853	3513
41	UNIV MARYLAND-COL PK	Walsh, J. L.	LARC	Chopra, I.	NAG 1-985	3515
41	UNIV MARYLAND-COL PK	Owens, F. C.	HQ-XE	Winkelmann, A. E.	NGT 00-070-090	3628
41	UNIV MARYLAND-COL PK	Owens, F. C.	HQ-LE	Donaldson, B.	NGT 21-002-823	3633
41	UNIV OF MIAMI	Miller, T.	MSFC	Branscome, L.	NAG 8-656	2807
41	UNIV MICH-ANN ARBOR	Sridhar, B.	ARC	Jain, R.	NCC 2-573	4068
41	UNIV MICH-ANN ARBOR	Shuart, M. J.	LARC	Waas, A. M.	NAG 1-1040	3982
41	UNIV MICH-ANN ARBOR	Perez, S. E.	LARC	Clark, S. K.	NSG 1607	4090
41	UNIV MICH-ANN ARBOR	Steinetz, B. M.	LERC	Kikuchi, N.	NAG 3-661	3992
41	UNIV MICH-ANN ARBOR	Moore, T. E.	MSFC	Gombosi, T. I.	NCC 8-1	4071
41	UNIV MICH-ANN ARBOR	Counts, J.	HQ-XE	Taylor, J. E.	NGT 00-070-115	4086
41	UNIV MICH-ANN ARBOR	Owens, F. C.	HQ-LB	Shin, K. G.	NGT 23-005-801	4088
41	U MINN-MNPLS-ST PAUL	Moin, P.	ARC	Lundgren, T. S.	NCA 2-329	4126
41	U MINN-MNPLS-ST PAUL	Kaiser, M.	GSFC	Kellogg, P.	NAS 5-30544	4123
41	U MINN-MNPLS-ST PAUL	Goodrich, W.	JSC	Tezduyar, T. E.	NAS 9-17892	4124
41	U MINN-MNPLS-ST PAUL	Bacon, B. J.	LARC	Garrard, W. L.	NAG 1-821	4100
41	UNIV MO-COLUMBIA	Webbon, B. W.	ARC	Miles, J. B.	NAG 2-589	4173
41	UNIV MO-COLUMBIA	Brown, J. L.	ARC	Miles, J. B.	NCC 2-199	4174
41	UNIV MO-COLUMBIA	Brown, J. L.	ARC	Miles, J. B.	NCC 2-566	4175
41	UNIV MO-ROLLA	Henderson, W. P.	LARC	Selberg, B. P.	NAG 1-975	4180
41	UNIV MO-ROLLA	Dittmar, J. H.	LERC	Eversman, W.	NAG 3-178	4181
41	UNIV NEBRASKA-LINCLN	Gupta, K. K.	ARC	Martin, C. W.	NCA 2-318	4250
41	UNIV OF NEVADA-RENO	Bencze, D. P.	ARC	Rose, W. C.	NCC 2-507	4259
41	UNIV OF NOTRE DAME	Schreiner, J. A.	ARC	Nelson, R. C.	NCA 2-162	3254
41	UNIV OF NOTRE DAME	Schiff, L. B.	ARC	Nelson, R. C.	NCA 2-406	3255
41	UNIV OF NOTRE DAME	Brandon, J. M.	LARC	Nelson, R. C.	NAG 1-727	3250
41	UNIV OF NOTRE DAME	McGhee, R. J.	LARC	Mueller, T. J.	NSG 1419	3258
41	UNIV OF NOTRE DAME	Groeneweg, J. F.	LERC	Atassi, H. M.	NAG 3-732	3252
41	UNIV OF NOTRE DAME	Owens, F. C.	HQ-LE	Nelson, R. C.	NGT 00-070-019	3256
41	UNIV OKLAHOMA-NORMAN	Bauer, S. X.	LARC	Emanuel, G.	NAG 1-886	5182
41	UNIV OREGON-EUGENE	Lawing, P. L.	LARC	Donnelly, R. J.	NAG 1-1044	5219
41	UNIV OREGON-EUGENE	Sutton, K.	LARC	Hansen, C. F.	NAG 1-1046	5220
41	UNIV OF PACIFIC	Steinle, F. W.	ARC	Murthy, S. V.	NCC 2-357	2335
41	UNIV OF PITTSBURGH	Kiraly, L. J.	LERC	Smolinski, P.	NAG 3-829	5399
41	U PUERTO RICO-MAYAGZ	Alton, L. R.	ARC	Hess, R. A.	NCC 2-496	6473
41	UNIV OF QUEENSLAND	Anderson, G. Y.	LARC	Stalker, R. J.	NAGW 674	6483
41	UNIV SAN FRANCISCO	Parnell, T. A.	MSFC	Benton, E. V.	NAG 8-138	2338
41	UNIV OF SOUTH DAKOTA	Rhea, D. C.	ARC	Granaas, M. M.	NAG 2-492	5488
41	UNIV OF SOUTHAMPTON	Ladson, C. L.	LARC	Goodyer, M. J.	NSG 7172	6496
41	UNIV OF SOUTHAMPTON	Boydin, R. P.	LARC	Goodyer, M. J.	NSG 7523	6497
41	UNIV OF SOUTHERN CAL	Seiner, J. M.	LARC	Ho, C. M.	NAG 1-819	2354
41	UNIV STHN COLORADO	Corliss, L. D.	ARC	Dunn, W. R.	NCC 2-276	2582
41	UNIV OF SYDNEY	Sutton, K.	LARC	Bird, G. A.	NAGW 728	6484
41	UNIV TENNESSEE-CHAT	Bobbitt, P. J.	LARC	Wu, J. M.	NAG 1-844	5501
41	UNIV TENNESSEE-KNOXV	Lawing, P. L.	LARC	Wu, J. M.	NAG 1-747	5504

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41	UNIV TENNESSEE-KNOXV	Waggoner, E. G.	LARC	Steinhoff, J. S.	NAG 1-898	5506
41	UNIV TENNESSEE-KNOXV	Vallely, D. P.	MSFC	Ali, M.	NAG 8-121	5510
41	UNIV TEXAS-AUSTIN	Tobak, M.	ARC	Panton, R. L.	NAG 2-398	5768
41	UNIV TEXAS-AUSTIN	Kalinowski, K.	GSFC	Jefferys, W. H.	NAS 5-29285	5820
41	UNIV TEXAS-AUSTIN	Kalinowski, J. K.	GSFC	Lambert, D.	NAS 5-29410	5823
41	UNIV TEXAS-AUSTIN	Gist, A. D.	JSC	Tesar, D.	NAG 9-188	5795
41	UNIV TEXAS-AUSTIN	Sunkel, J. W.	JSC	Wie, B.	NAG 9-279	5800
41	UNIV TEXAS-AUSTIN	Bishop, L. R.	JSC	Speyer, J. L.	NAG 9-288	5802
41	UNIV TEXAS-AUSTIN	Sunkel, J. W.	JSC	Craig, R. R.	NAG 9-357	5807
41	UNIV TEXAS-AUSTIN	Wieting, A. R.	LARC	Wilson, D.	NAG 1-941	5761
41	UNIV TEXAS-AUSTIN	Moerder, D. D.	LARC	Spgyer, J. L.	NAG 1-944	5762
41	UNIV TEXAS-AUSTIN	Moerder, D. D.	LARC	Spgyer, J. L.	NAG 1-945	5763
41	UNIV TEXAS-AUSTIN	Zorunski, W. E.	LARC	Dolling, D. S.	NAG 1-1005	5765
41	UNIV TEXAS-AUSTIN	Hingst, W. R.	LERC	Dolling, D. S.	NAG 3-1023	5777
41	UNIV TEXAS-AUSTIN	Owens, F. C.	HQ-XE	Tapley, B. D.	NGT 00-050-155	5835
41	UNIV TEXAS-AUSTIN	Owens, F. C.	HQ-XE	Dolling, D. S.	NGT 00-050-172	5836
41	UNIV TEXAS-AUSTIN	Owens, F. C.	HQ-XE	Fowler, W. T.	NGT 00-050-222	5839
41	UNIV TEXAS-AUSTIN	Owens, F. C.	HQ-XE	Dolling, D. S.	NGT 00-070-032	5852
41	UNIV TEXAS-AUSTIN	Owens, F. C.	HQ-XE	Dolling, D. S.	NGT 00-070-145	5854
41	UNIV TEXAS-AUSTIN	Owens, F. C.	HQ-LE	Fowler, W. T.	NGT 00-050-062	5834
41	UNIV TEXAS-AUSTIN	Owens, F. C.	HQ-LE	Nozette, S.	NGT 00-070-023	5850
41	UNIV TEXAS-DALLAS	Duckett, R. J.	LARC	Hanson, W. B.	NAS 1-18793	5872
41	UNIV TEXAS-S ANTONIO	Chamis, C. C.	LERC	Boyce, L.	NAG 3-867	5917
41	UNIV OF TOLEDO	Vargas, M.	LERC	Dewitt, K. J.	NAG 3-72	5143
41	UNIV OF TOLEDO	Stefko, G. L.	LERC	Keith, T. G.	NAG 3-742	5149
41	UNIV OF TOLEDO	Luidens, R. W.	LERC	Keith, T. G.	NAG 3-937	5154
41	UNIV OF TOLEDO	Kiraly, L. J.	LERC	Standley, H. M.	NAG 3-975	5156
41	UNIV OF TOLEDO	Stefko, G. L.	LERC	Keith, T. G.	NAG 3-1068	5158
41	UNIV OF TOLEDO	Hacha, T. H.	LERC	Dewitt, K. J.	NCC 3-69	5167
41	UNIV OF TOLEDO	Stefko, G. L.	LERC	Keith, T. G., Jr.	NSG 3139	5171
41	UNIV OF UTAH	Crews, J. H.	LARC	Nairn, J. A.	NAS 1-18833	5936
41	UNIV OF VIRGINIA	Northam, G. B.	LARC	McDaniel, J. C.	NAG 1-373	6102
41	UNIV OF VIRGINIA	Northan, G. B.	LARC	McDaniel, J. C.	NAG 1-795	6105
41	UNIV OF VIRGINIA	Starnes Jr., J. H.	LARC	Herakovich, C. T.	NAG 1-841	6106
41	UNIV OF VIRGINIA	Owens, F. C.	HQ-XE	McDaniel, J. C.	NGT 00-050-142	6144
41	UNIV OF WASHINGTON	Gong, L.	ARC	Emery, A. F.	NCC 2-576	6328
41	UNIV OF WASHINGTON	Martin, J. A.	LARC	Hertzberg, A.	NAG 1-746	6253
41	UNIV OF WASHINGTON	Ostroff, A. J.	LARC	Berg, M. C.	NAG 1-1055	6257
41	UNIV OF WASHINGTON	Hingst, W. R.	LERC	Gessner, F. B.	NAG 3-376	6258
41	UNIV OF WASHINGTON	Lezberg, E. A.	LERC	Hertzberg, A.	NAG 3-1061	6260
41	UNIV OF WYOMING	O'brien, T. K.	LARC	Zimmerman, R. S.	NAG 1-674	6462
41	VANDERBILT UNIVERSTY	Wortham, G. B.	LARC	Pitz, R. W.	NAG 1-770	5529
41	VANDERBILT UNIVERSTY	Blanchard, R. C.	LARC	Potter, J. L.	NAG 1-921	5531
41	VANDERBILT UNIVERSTY	Patterson, H.	MSFC	Hargava, V. B.	NAS 8-37764	5540
41	VIRGINIA POLY INST	Gelhausen, P. A.	ARC	Myklebust, R. A.	NAG 2-461	6203
41	VIRGINIA POLY INST	Jagielski, J. M.	GSFC	Lee, F. C.	NAG 5-1232	6214
41	VIRGINIA POLY INST	Starnes Jr., J. H.	LARC	Haftka, R. T.	NAG 1-168	6164
41	VIRGINIA POLY INST	Starnes, J. H., Jr.	LARC	Johnson, E. R.	NAG 1-201	6165
41	VIRGINIA POLY INST	Adelman, H. M.	LARC	Haftka, R. T.	NAG 1-224	6166
41	VIRGINIA POLY INST	Silcox, R. J.	LARC	Fuller, C. R.	NAG 1-390	6170
41	VIRGINIA POLY INST	Starnes, J. H., Jr.	LARC	Johnson, E. R.	NAG 1-537	6171
41	VIRGINIA POLY INST	Adelman, H. M.	LARC	Haftka, R. T.	NAG 1-603	6173
41	VIRGINIA POLY INST	Starnes, J. H.	LARC	Gurdal, Z.	NAG 1-643	6174
41	VIRGINIA POLY INST	Knight, N. F., Jr.	LARC	Griffin, O. H., Jr.	NAG 1-675	6175
41	VIRGINIA POLY INST	Holmes, B. J.	LARC	Nayfeh, A. H.	NAG 1-714	6176
41	VIRGINIA POLY INST	Stein, M.	LARC	Librescu, L.	NAG 1-749	6177
41	VIRGINIA POLY INST	Rudy, D. H.	LARC	Walters, R. W.	NAG 1-776	6180
41	VIRGINIA POLY INST	Anders, J. B.	LARC	Schetz, J. A.	NAG 1-843	6185
41	VIRGINIA POLY INST	Thomas, J. L.	LARC	Walters, R. W.	NAG 1-866	6187
41	VIRGINIA POLY INST	Arbuckle, P. D.	LARC	Stallford, H. L.	NAG 1-873	6188

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41	VIRGINIA POLY INST	Nemeth, M. P.	LARC	Hyer, M. W.	NAG 1-901	6190
41	VIRGINIA POLY INST	Moerder, D. D.	LARC	Cliff, E. M.	NAG 1-946	6192
41	VIRGINIA POLY INST	Thomas, J. L.	LARC	Walters, R. W.	NAG 1-992	6195
41	VIRGINIA POLY INST	Knight, N. F.	LARC	Reddy, J. N.	NAG 1-1030	6198
41	VIRGINIA POLY INST	Waggoner, E. G.	LARC	Mason, W. H.	NAG 1-1037	6199
41	VIRGINIA POLY INST	Pittman, J. L.	LARC	Walters, R. W.	NAG 1-1045	6201
41	VIRGINIA POLY INST	Prior, E. J.	LARC	Ng, W.	NAS 1-18106	6222
41	VIRGINIA POLY INST	Prior, E. J.	LARC	Unavailable	NAS 1-18471	6223
41	VIRGINIA POLY INST	Farley, G. L.	LARC	Hyer, M. W.	NCC 1-130	6226
41	VIRGINIA POLY INST	Tweedt, D. L.	LERC	Ng, W. F.	NAG 3-830	6205
41	VIRGINIA POLY INST	Wood, J. R.	LERC	Ng, W.	NAG 3-870	6206
41	VIRGINIA POLY INST	Schumann, L. F.	LERC	Moore, J.	NAG 3-919	6207
41	VIRGINIA POLY INST	Hopkins, D. A.	LERC	Reddy, J. N.	NAG 3-933	6208
41	VIRGINIA POLY INST	Wood, J. R.	LERC	Ng, W.	NAG 3-1029	6209
41	WENTWORTH INST TECH	White, B.	HQ-U	Mullins, R. T.	NGT 22-005-900	3934
41	WASHINGTON ST UNIV	Bach, R. E.	ARC	Grantham, W. J.	NCA 2-216	6349
41	WASHINGTON UNIVERSTY	Knight, N. F.	LARC	Szabo, B. A.	NAG 1-639	4186
41	WAYNE STATE UNIV	Maestrello, L.	LARC	Chow, P.	NAG 1-460	4092
41	WEST VIRGINIA UNIV	Campbell, R. L.	LARC	Kuhlman, J. M.	NAG 1-625	6353
41	WEST VIRGINIA UNIV	Paulson, J. W., Jr.	LARC	Kuhlman, J. M.	NAG 1-748	6355
41	WEST VIRGINIA UNIV	Wood, R. M.	LARC	Kuhlman, J. M.	NAG 1-951	6356
41	WEST VIRGINIA UNIV	Owens, F. C.	HQ-LE	Sivaneri, N.	NGT 49-001-802	6362
41	WESTERN NEW ENG COL	Bishop, A. R.	LERC	Presz, W. M.	NAG 3-610	3935
41	WICHITA STATE UNIV	Bidwell, G. S.	LERC	Zumwalt, G. W.	NAG 3-566	3382
41	WICHITA STATE UNIV	Bidwell, C. S.	LERC	Zamwalt, G. W.	NAG 3-684	3383
41	YALE UNIVERSITY	Kumar, A.	LARC	Sreenivasan, K. R.	NAG 1-1034	2593
41	YALE UNIVERSITY	Clayton, G. C.	HQ-EZ	Demarque, P.	NAGW 778	2605
42	AUBURN UNIV-AUBURN	Dabbs, J. R.	MSFC	Greene, M. E.	NAG 8-636	1028
42	AUBURN UNIV-AUBURN	Oran, W. A.	HQ-IC	Askew, R.	NAGW 1192	1034
42	CALIF INST OF TECH	Taylor, R. S.	LARC	Doyle, J. C.	NAG 1-967	1496
42	CARNEGIE-MELLON UNIV	Juday, R.	JSC	Kumar, V.	NAG 9-247	5236
42	CATHOLIC UNIVERSITY	Ormes, J. F.	GSFC	Dame, R. E.	NAG 5-848	2640
42	CLEVELAND STATE UNIV	Mroz, T.	LERC	Pintz, A.	NCC 3-143	4988
42	COLORADO STATE UNIV	Kolecki, J. C.	LERC	Wilbur, P. J.	NAG 3-776	2384
42	COLUMBIA UNIVERSITY	Juang, J. N.	LARC	Longman, R. W.	NAG 1-649	4453
42	GEORGE WASHINGTON U	Busse, J. R.	GSFC	Liebowitz, H.	NCC 5-43	2681
42	GEORGE WASHINGTON U	Arrington, J. P.	LARC	Liebowitz, H.	NCC 1-104	2680
42	GEORGIA INST OF TECH	Moeroer, D. D.	LARC	Calise, A. J.	NAG 1-660	2845
42	IOWA STATE UNIV	Green, M. J.	ARC	Tannehill, J. C.	NAG 2-502	3265
42	LAMAR UNIVERSITY	Hamilton, D. A.	JSC	Corder, P.	NAG 9-286	5563
42	MASS INST OF TECH	Kostiuk, T.	GSFC	Spears, D.	NAS 5-28564	3834
42	MASS INST OF TECH	Schulz, D.	GSFC	Bradt, H.	NAS 5-29116	3835
42	MASS INST OF TECH	Ogalvie, K.	GSFC	Lazarus, J.	NAS 5-30550	3840
42	MASS INST OF TECH	Fontana, A.	LARC	Crawley, E. F.	NAG 1-915	3720
42	MASS INST OF TECH	Taylor, R. S.	LARC	Vander Velde, W. E.	NAG 1-968	3722
42	MASS INST OF TECH	Clark, L. G.	LARC	Crowley, E.	NAS 1-18690	3830
42	MASS INST OF TECH	Kaluzienski, L. J.	HQ-EZ	Knight, F. K.	NAGW 1168	3809
42	MASS INST OF TECH	Montemerlo, M.	HQ-RC	Mar, J. W.	NAGW 21	3793
42	NEW MEX ST U-LAS CR	Ormes, J. F.	GSFC	Golden, R. L.	NAG 5-847	4386
42	NO CAR A&T STATE U	Montgomery, R. C.	LARC	Abu-saba, E.	NAG 1-405	4770
42	NO CAR A&T STATE U	Juang, J. N.	LARC	Lebby, G.	NAG 1-870	4774
42	NO CAR A&T STATE U	Montgomery, R. C.	LARC	Abu-saba, E. G.	NAG 1-997	4777
42	NO CAROLINA STATE U	Montgomery, R. C.	LARC	Silverberg, L.	NAG 1-977	4792
42	NO CAROLINA STATE U	Sparks, D. W.	LARC	Silverberg, L.	NCC 1-116	4815
42	NORTHWESTERN UNIV	Chamis, C. C.	LERC	Belytschko, T.	NAG 3-822	2995
42	OHIO STATE UNIV	Montgomery, R. C.	LARC	Ozguner, U.	NAG 1-720	5006
42	OLD DOMINION UNIV	Juang, J. N.	LARC	Huang, J. K.	NAG 1-830	6047
42	OLD DOMINION UNIV	Juang, J. N.	LARC	Chew, M. S.	NAG 1-952	6056
42	OLD DOMINION UNIV	Clark, L. G.	LARC	Alberts, T. E.	NAS 1-18687	6068
42	PENN STATE U-UNIV PK	Conway, E. J.	LARC	Micci, M. M.	NAG 1-1012	5286

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42	PRINCETON UNIVERSITY	Balkanyi, L. R.	LERC	Mease, K.	NAG 3-915	4326
42	PRINCETON UNIVERSITY	Balkanyi, L. R.	LERC	Mease, K. D.	NAG 3-1060	4331
42	PRINCETON UNIVERSITY	Byers, D. C.	LERC	Jahn, R. G.	NAG 3-1064	4332
42	PURDUE UNIVERSITY	Taylor, R. S.	LARC	Skelton, R. E.	NAG 1-958	3198
42	RICE UNIVERSITY	Kalinowski, J. K.	GSFC	O'dell, C. R.	NAS 5-29451	5603
42	RICE UNIVERSITY	Cooper, P. A.	LARC	Spanos, P. D.	NAG 1-766	5575
42	RICE UNIVERSITY	Queen, E. M.	LARC	Miele, A.	NAG 1-1029	5576
42	SAN JOSE STATE UNIV	Lomax, W. C.	ARC	Unwin, E.	NCC 2-640	1680
42	STANFORD UNIVERSITY	Lum, H.	ARC	Cannon, R. H.	NCC 2-333	1809
42	STANFORD UNIVERSITY	Lemke, L. G.	ARC	Powell, J. D.	NCC 2-389	1811
42	STANFORD UNIVERSITY	Lemke, L. G.	ARC	Powell, J. D.	NCC 2-528	1819
42	STANFORD UNIVERSITY	Mulac, M. W.	LERC	Breakwell, J. V.	NAG 3-826	1706
42	STANFORD UNIVERSITY	Mellott, M. M.	HQ-EE	Banks, P. M.	NAGW 235	1727
42	TENNESSEE STATE UNIV	Juang, J. N.	LARC	Keel, L.	NAG 1-863	5496
42	TEXAS A&M UNIVERSITY	Rocha, R.	JSC	Gerhold, C.	NAS 9-17972	5680
42	TEXAS A&M UNIVERSITY	Fox, T. H.	MSFC	Noah, S. T.	NAS 8-37465	5677
42	UNIV ALA-HUNTSVILLE	Clark, L. G.	LARC	Alexander, J. I.	NAS 1-18683	1152
42	UNIV OF ARIZONA	Myers, I. T.	LERC	Maisel, J.	NAG 3-714	1304
42	UNIV OF ARIZONA	Moore, T. E.	MSFC	Sandel, B. R.	NAG 8-110	1332
42	UNIV CALIF-BERKELEY	Hollenbach, D.	ARC	Welch, W. J.	NCA 2-423	1957
42	UNIV CALIF-BERKELEY	Clark, L. G.	LARC	Rubinsky, B.	NAS 1-18686	1923
42	UNIV CALIF-L ANGELES	Austin, J. G.	MSFC	Apostolakis, G. E.	NAS 8-37750	2132
42	UNIV CALIF-SAN DIEGO	Schulz, D.	GSFC	Rothschild, R.	NAS 5-29117	2234
42	UNIV CALIF-SAN DIEGO	Roberts, B. B.	JSC	Arnold, J. R.	NAG 9-186	2201
42	UNIV OF CINCINNATI	Cooper, P. A.	LARC	Allemang, R. J.	NAG 1-942	5110
42	UNIV OF CINCINNATI	Taylor, R. S.	LARC	Allemang, R. J.	NAG 1-953	5111
42	UNIV OF CINCINNATI	Millis, M. G.	LERC	Disimile, P. J.	NAG 3-948	5120
42	UNIV OF DELAWARE	Ormes, J. A.	GSFC	Evenson, P.	NAG 5-856	2616
42	UNIV OF EVANSVILLE	Tacina, R. R.	LERC	Riley, B.	NAG 3-746	3249
42	UNIV ILLINOIS-URBANA	Malin, J. T.	JSC	Forbus, K. D.	NAG 9-137	3131
42	UNIV ILLINOIS-URBANA	Mulac, M. W.	LERC	Conway, B. A.	NAG 3-805	3122
42	UNIV ILLINOIS-URBANA	Byers, D. C.	LERC	Singer, C. E.	NAG 3-1037	3125
42	UNIV MARYLAND-COL PK	Morgan Jr., S. H.	MSFC	Paik, H. J.	NAS 8-38137	3599
42	UNIV MICH-ANN ARBOR	Way, S. H.	GSFC	Carignan, G. R.	NAS 5-30112	4058
42	UNIV OF NEW MEXICO	Duke, M. B.	JSC	Burns, J. O.	NAG 9-245	4421
42	UNIV STUTTGART	Curran, F. M.	LERC	Schrade, H. O.	NAGW 1736	6502
42	UNIV TEXAS-ARLINGTON	Mah, R.	ARC	Briggs, K. H.	NCA 2-422	5759
42	UNIV TEXAS-AUSTIN	Rocha, R.	JSC	Craig, R.	NAS 9-17254	5827
42	UNIV TEXAS-AUSTIN	Taylor, R. S.	LARC	Wie, B.	NAG 1-965	5764
42	UNIV OF TOLEDO	Halford, G. R.	LERC	Keith, T. G.	NCC 3-120	5168
42	UNIV OF VIRGINIA	Owens, F. C.	HQ-LE	Hudson, J. L.	NGT 00-050-105	6141
42	UNIV OF WASHINGTON	Conway, E. J.	LARC	Hertzberg, A.	NAG 1-327	6252
42	UNIV WISC-MADISON	Leckrone, D. A.	GSFC	Bless, R.	NAS 5-29448	6435
42	UTAH STATE UNIV	Figueroa, O.	GSFC	Haycock, R.	NAS 5-29422	5952
42	UTAH STATE UNIV	Clark, L. G.	LARC	Redd, F. J.	NAS 1-18682	5951
42	VIRGINIA POLY INST	Williams, J. P.	LARC	Meirovitch, L.	NAG 1-225	6167
42	VIRGINIA POLY INST	Montgomery, R. C.	LARC	Lindner, D. K.	NAG 1-840	6184
42	VIRGINIA POLY INST	McGowan, P. E.	LARC	Smith, S. W.	NAG 1-960	6193
42	VIRGINIA POLY INST	Welch, S. S.	LARC	Lindner, D. K.	NAG 1-1006	6196
42	YORK UNIVERSITY	Kalinowski, J. K.	GSFC	Caldwell, J. J.	NAS 5-30294	6490
43	ALABAMA A&M UNIV	Randall, J. L.	MSFC	Tadros, S. H.	NAG 8-90	1009
43	AUBURN UNIV-AUBURN	Owens, F. C.	HQ-XE	Moore, R. K.	NGT 00-050-374	1052
43	AUBURN UNIV-AUBURN	Owens, F. C.	HQ-LE	Tatarchuk, B. J.	NGT 01-003-801	1058
43	CASE WESTERN RESERVE	Hagedorn, N. H.	LERC	Tryk, D. A.	NAG 3-694	4860
43	CASE WESTERN RESERVE	Owens, F. C.	HQ-XE	Qutubuddin, S.	NGT 00-050-141	4935
43	CLARKSON UNIVERSITY	Grant, H.	MSFC	Wilcox, W. R.	NAG 8-541	4443
43	CLARKSON UNIVERSITY	Owens, F. C.	HQ-XE	Subramanian, R. S.	NGT 00-050-212	4448
43	CLARKSON UNIVERSITY	Owens, F. C.	HQ-XE	Subramanian, S.	NGT 00-050-213	4449
43	CLARKSON UNIVERSITY	Owens, F. C.	HQ-XE	Wilcox, W. R.	NGT 00-050-310	4450
43	CLARKSON UNIVERSITY	Owens, F. C.	HQ-LE	Subramanian, R. S.	NGT 33-011-801	4451

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43	CLEMSON UNIV-CLEMSON	Baucom, R. M.	LARC	Edie, D. D.	NAG 1-680	5452
43	CLEVELAND STATE UNIV	Rutledge, S. K.	LERC	Hambourger, P. D.	NCC 3-19	4961
43	CLEVELAND STATE UNIV	Prokopius, P. R.	LERC	Coulman, G.	NCC 3-23	4962
43	CLEVELAND STATE UNIV	Hurwitz, F. I.	LERC	Andrist, A. H.	NCC 3-63	4971
43	CORNELL UNIVERSITY	Salzman, J. A.	LERC	Steen, P. H.	NAG 3-801	4519
43	FLORIDA ATLANTIC U	Lin, F. N.	KSC	Chow, W.	NAS10-11569	2724
43	HAMPTON UNIVERSITY	Northam, G. B.	LARC	Adeyiga, A.	NAG 1-767	6004
43	JOHNS HOPKINS UNIV	Yi, T. Y.	GSFC	Prentice, G.	NAG 5-877	3454
43	LEHIGH UNIVERSITY	Kornfeld, D. M.	MSFC	Vanderitoff, J. W.	NAS 8-36286	5266
43	MASS INST OF TECH	Price, D. F.	JSC	Tester, J. W.	NAG 9-252	3790
43	NO CAROLINA STATE U	Hagedorn, N.	LERC	Fedkiw, P. S.	NAG 3-649	4794
43	POLYTECHNIC U	Owens, F. C.	HQ-LE	Mijovic, J.	NGT 00-050-122	4621
43	PRINCETON UNIVERSITY	Kiser, J. D.	LERC	Debenedetti, P. G.	NAG 3-859	4325
43	PRINCETON UNIVERSITY	Snyder, R. S.	MSFC	Saville, D. A.	NAG 8-749	4340
43	STANFORD UNIVERSITY	Altman, R. L.	ARC	Boudart, M.	NCA 2-360	1788
43	STATE UNIV NY-BUFFAL	Dicarlo, J. A.	LERC	Hlavacek, V.	NAG 3-863	4690
43	STATE UNIV NY-BUFFAL	Petrasek, D. W.	LERC	Hlavacek, V.	NAG 3-897	4691
43	TEXAS A&M UNIVERSITY	Darcy, E.	JSC	Martin, C. R.	NAG 9-173	5652
43	TEXAS A&M UNIVERSITY	Verostko, C. E.	JSC	Murphy, O. J.	NAG 9-350	5665
43	TEXAS A&M UNIVERSITY	Owens, F. C.	HQ-XE	White, R. E.	NGT 00-070-057	5695
43	TEXAS A&M UNIVERSITY	Owens, F. C.	HQ-LE	White, R. E.	NGT 00-070-011	5694
43	TEXAS A&M UNIVERSITY	Evanich, P. L.	HQ-RP	Brockis, J. O.	NAGW 1779	5674
43	UNIV ALA-HUNTSVILLE	Wilhold, G. A.	MSFC	Chung, T. J.	NAG 8-95	1105
43	UNIV OF ARIZONA	Kublin, T.	MSFC	Ramohalli, K.	NAG 8-757	1337
43	UNIV CALIF-DAVIS	Cagliostro, D. E.	ARC	Smith, J. M.	NCC 2-590	2037
43	UNIV CALIF-SAN DIEGO	Schryer, D. R.	LARC	Herz, R. K.	NAG 1-823	2167
43	UNIV CALIF-SAN DIEGO	Schryer, D. R.	LARC	Herz, R. K.	NAG 1-900	2169
43	UNIV CALIF-SAN DIEGO	Schryer, D. R.	LARC	Herz, R. K.	NAG 1-1051	2170
43	UNIV COLORADO-BOLDR	Salzman, J. A.	LERC	Davis, R. H.	NAG 3-993	2414
43	UNIV COLORADO-BOLDR	Dewitt, R.	LERC	Timmerhaus, K.	NAG 3-1018	2416
43	UNIV COLORADO-BOLDR	Owens, F. C.	HQ-XE	Davis, R. H.	NGT 00-050-367	2552
43	UNIV COLORADO-BOLDR	Owens, F. C.	HQ-XE	Biringer, S.	NGT 00-050-446	2553
43	UNIV OF FLORIDA	Schryer, D. R.	LARC	Hoflund	NAG 1-794	2769
43	UNIV OF FLORIDA	Owens, F. C.	HQ-XE	Hoflund, G. B.	NGT 00-070-064	2801
43	UNIV HOUSTON-HOUSTON	Darcy, E.	JSC	Pollard, R.	NAG 9-178	5714
43	UNIV HOUSTON-HOUSTON	Kroll, K.	JSC	Lienhard, J. H.	NAS 9-17442	5741
43	UNIV HOUSTON-HOUSTON	McQuillen, J. B.	LERC	Dukler, A. E.	NAG 3-510	5710
43	UNIV MICH-ANN ARBOR	Hardy, T. L.	LERC	Sonntag, R. E.	NAG 3-850	3994
43	UNIV MICH-ANN ARBOR	Owens, F. C.	HQ-LE	Fogler, H. S.	NGT 00-050-095	4076
43	UNIV MO-COLUMBIA	Owens, F. C.	HQ-XE	Marrero, T. R.	NGT 00-050-061	4176
43	UNIV MO-ROLLA	Pellet, G. L.	LARC	Isaac, K. M.	NAG 1-861	4179
43	UNIV OF PENNSYLVANIA	Owens, F. C.	HQ-XE	Forsman, W.	NGT 00-050-139	5394
43	UNIV OF TOLEDO	Chai, A. T.	LERC	Oliver, D. O.	NAG 3-910	5153
43	UNIV OF TOLEDO	Owens, F. C.	HQ-XE	Dewitt, K. J.	NGT 00-050-371	5170
43	UNIV OF UTAH	Clark, I. O.	LARC	Stringfellow, G. B.	NAG 1-608	5921
43	UNIV OF VIRGINIA	Owens, F. C.	HQ-XE	Lilleleht, L. U.	NGT 00-050-334	6146
43	VIRGINIA POLY INST	Pellet, G. L.	LARC	Dancey, C. L.	NAG 1-973	6194
43	YALE UNIVERSITY	Owens, F. C.	HQ-XE	Rosner, D. E.	NGT 00-050-377	2611
44	CLEVELAND STATE UNIV	Vannucci, R. D.	LERC	Hemann, J. H.	NCC 3-68	4973
44	HOWARD UNIVERSITY	Burgess, A.	GSFC	Spencer, M. G.	NAG 5-246	2692
44	NEW MEX ST U-LAS CR	Wydeven, T.	ARC	Jacquez, R. B.	NCA 2-328	4402
44	NEW MEX ST U-LAS CR	Owens, F. C.	HQ-XE	Jacquez, R. B.	NGT 00-070-114	4408
44	OHIO UNIVERSITY	Kiraly, L. J.	LERC	Akl, F. A.	NAG 3-902	5073
44	OLD DOMINION UNIV	Storaasli, O. O.	LARC	Nguyen, D. T.	NAG 1-858	6051
44	OLD DOMINION UNIV	Owens, F. C.	HQ-XE	Nguyen, D. T.	NGT 00-070-126	6093
44	TEXAS A&M UNIVERSITY	Tanner, J. A.	LARC	Tielking, J. T.	NAG 1-644	5627
44	TEXAS A&M UNIVERSITY	Owens, F. C.	HQ-XE	Roschke, P. N.	NGT 00-070-130	5698
44	UNIV COLORADO-BOLDR	Owens, F. C.	HQ-LE	Sture, S.	NGT 00-070-001	2559
44	UNIV HOUSTON-HOUSTON	Sauer, R. L.	JSC	Symons, J. M.	NAG 9-284	5727
44	UNIV OF PITTSBURGH	Bivins, R.	HQ	McWilliams, P. A.	NASW 4204	5407

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44	UNIV TEXAS-AUSTIN	Salzman, J. A.	LERC	Koschmieder, E. L.	NAG 3-921	5775
44	UNIV TEXAS-AUSTIN	Schwartz, E.	HQ-XE	O'Connor, J. T.	NGT 00-050-473	5847
45	ALABAMA A&M UNIV	Randall, J. L.	MSFC	Murty, S. S.	NSG 8037	1024
45	ARIZONA STATE UNIV	Gilreath, M. C.	LARC	Balanis, C. A.	NAG 1-562	1225
45	ARIZONA STATE UNIV	Brinker, D. J.	LERC	Wang, E. Y.	NAG 3-383	1231
45	ARIZONA STATE UNIV	Wenberg, I.	LERC	Shen, C. C.	NAG 3-650	1235
45	AUBURN UNIV-AUBURN	Jo Crannell, C.	GSFC	Greene, M.	NAS 5-30566	1036
45	AUBURN UNIV-AUBURN	Cataldo, R. L.	LERC	Gordon, L. B.	NAG 3-1055	1025
45	AUBURN UNIV-AUBURN	Owens, F. C.	HQ-XE	Tzeng, Y.	NGT 00-050-354	1050
45	AUBURN UNIV-AUBURN	Owens, F. C.	HQ-XE	Baginski, M. E.	NGT 00-050-435	1054
45	AUBURN UNIV-AUBURN	Owens, F. C.	HQ-XE	Tzeng, Y.	NGT 00-050-531	1055
45	AUBURN UNIV-AUBURN	Owens, F. C.	HQ-XE	Tzeng, Y.	NGT 00-070-094	1056
45	AUBURN UNIV-AUBURN	Owens, F. C.	HQ-XE	Askew, R. F.	NGT 00-070-135	1057
45	BRANDEIS UNIVERSITY	Owens, F. C.	HQ-LE	Waltz, D.	NGT 00-050-068	3663
45	CARNEGIE-MELLON UNIV	Juday, R. D.	JSC	Casasent, D.	NAG 9-383	5237
45	CARNEGIE-MELLON UNIV	Padilla, P. A.	LARC	Siewiorek, D. P.	NAG 1-190	5223
45	CARNEGIE-MELLON UNIV	Bryant, W. H.	LARC	Casasent, D.	NAG 1-903	5224
45	CARNEGIE-MELLON UNIV	Owens, F. C.	HQ-XE	Segall, Z.	NGT 00-050-474	5245
45	CASE WESTERN RESERVE	Seasholtz, R. G.	LERC	Edwards, R. V.	NAG 3-2	4845
45	CASE WESTERN RESERVE	Kish, J. A.	LERC	Loparo, K. A.	NAG 3-800	4873
45	CASE WESTERN RESERVE	Leonard, R. F.	LERC	Tabib-azar, M.	NAG 3-816	4876
45	CASE WESTERN RESERVE	Ratajczak, A. J.	LERC	Ostrach, S.	NAG 3-886	4882
45	CASE WESTERN RESERVE	Dolce, J. L.	LERC	Pao, Y.	NAG 3-922	4884
45	CASE WESTERN RESERVE	Ponchak, G. E.	LERC	Collin, R. E.	NCC 3-29	4899
45	CASE WESTERN RESERVE	Bhasin, K. B.	LERC	Gordon, W. L.	NCC 3-40	4901
45	CASE WESTERN RESERVE	Alterovitz, S. A.	LERC	Liu, C. C.	NCC 3-97	4912
45	CASE WESTERN RESERVE	Bhasin, K. B.	LERC	Claspy, P. C.	NCC 3-99	4913
45	CATHOLIC UNIVERSITY	Fedor, J. V.	GSFC	Baz, A.	NAG 5-749	2638
45	CATHOLIC UNIVERSITY	Premack, T.	GSFC	Nguyen, C. C.	NAG 5-780	2639
45	CITY COLLEGE OF N Y	Owens, F. C.	HQ-XE	Alfano, R. R.	NGT 00-070-026	4435
45	CLARKSON UNIVERSITY	Secunde, R. R.	LERC	Demerdash, N. A.	NAG 3-818	4442
45	CLEMSON UNIV-CLEMSON	Parsons, C. L.	GSFC	Ulbrich, C. W.	NAG 5-651	5462
45	CLEMSON UNIV-CLEMSON	Dominy, C. T.	GSFC	Collins, A. S.	NAS 5-30688	5464
45	CLEMSON UNIV-CLEMSON	MacKenzie, A. I.	LARC	Baxa, E. G.	NAG 1-928	5457
45	CLEMSON UNIV-CLEMSON	Owens, F. C.	HQ-XE	Baxa, E. G.	NGT 00-050-414	5472
45	CLEMSON UNIV-CLEMSON	Owens, F. C.	HQ-XE	Baxa, E. G.	NGT 00-070-055	5475
45	CLEVELAND STATE UNIV	Flood, D. J.	LERC	Goradia, M. G.	NAG 3-241	4943
45	CLEVELAND STATE UNIV	Brinker, D. J.	LERC	Goradia, C.	NAG 3-249	4944
45	CLEVELAND STATE UNIV	Weinberg, I.	LERC	Goradia, C.	NAG 3-658	4947
45	CLEVELAND STATE UNIV	Baumbick, R. J.	LERC	Anthran, D. J.	NCC 3-58	4969
45	CLEVELAND STATE UNIV	Lesco, D. J.	LERC	Anthran, D. J.	NCC 3-66	4972
45	CLEVELAND STATE UNIV	Sater, B. L.	LERC	Smith, R. W.	NCC 3-86	4977
45	CLEVELAND STATE UNIV	Baumbick, R. J.	LERC	Anthran, D.	NCC 3-98	4980
45	CLEVELAND STATE UNIV	Matus, L. G.	LERC	Goradia, M. G.	NCC 3-121	4984
45	COLBY COLLEGE	Snyder, D. B.	LERC	Metz, R. N.	NAG 3-576	3435
45	CORNELL UNIVERSITY	Owens, F. C.	HQ-XE	Kelley, M. C.	NGT 00-070-117	4587
45	CORNELL UNIVERSITY	Owens, F. C.	HQ-XE	Kelley, M. C.	NGT 00-070-118	4588
45	CORNELL UNIVERSITY	Owens, F. C.	HQ-LE	Kintner, P. M.	NGT 00-070-008	4586
45	DREXEL UNIVERSITY	Kunath, R. R.	LERC	Herczfeld, P. R.	NCC 3-84	5255
45	DREXEL UNIVERSITY	Kunath, R. R.	LERC	Daryoush, A. S.	NCC 3-113	5256
45	DREXEL UNIVERSITY	Kunath, R. R.	LERC	Daryoush, A. S.	NCC 3-149	5257
45	EASTERN WASH UNIV	Bogue, R. K.	ARC	Hale, A. L.	NCC 2-437	6249
45	GEORGIA INST OF TECH	Clark, L. G.	LARC	Blue, M. D.	NAS 1-14654	2880
45	GEORGIA INST OF TECH	O'neal, R. L.	LARC	Gaylord, T. K.	NAS 1-15370	2881
45	GEORGIA INST OF TECH	Owens, F. C.	HQ-XE	Rodrique, G. P.	NGT 00-050-526	2900
45	HOWARD UNIVERSITY	Burgess, A. S.	GSFC	Chowdhary, R.	NAG 5-1049	2696
45	HOWARD UNIVERSITY	Dargo, D.	GSFC	Harris, G. L.	NAG 5-1127	2698
45	HOWARD UNIVERSITY	Truskowski, W. F.	GSFC	Michal, G. M.	NCC 5-25	2702
45	ILL INST OF TECH	Owens, F. C.	HQ-XE	Wong, T. T.	NGT 00-050-434	2990
45	JOHN CARROLL UNIV	Baumbick, R. J.	LERC	Fritsch, K.	NAG 3-571	4993

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45	JOHNS HOPKINS UNIV	Abshire, J. B.	GSFC	Davidson, F. M.	NAG 5-356	3450
45	JOHNS HOPKINS UNIV	Pitts, F. L.	LARC	Masson, G. E.	NSG 1442	3492
45	MASS INST OF TECH	Lum, H.	ARC	Clark, D. D.	NAG 2-582	3732
45	MASS INST OF TECH	Owens, F. C.	HQ-XE	McIntosh, R. E.	NGT 00-050-191	3868
45	MASS INST OF TECH	Owens, F. C.	HQ-LE	Perez, L.	NGT 22-009-905	3879
45	MISSISSIPPI STATE U	Thomas, H. L.	MSFC	Ingels, F. M.	NAG 8-104	4151
45	MISSISSIPPI STATE U	Parker, G. A.	MSFC	Ingels, F. M.	NAS 8-36044	4156
45	NEW MEX INST MINING	Blakeslee, R.	MSFC	Brook, M.	NAG 8-66	4377
45	NEW MEX ST U-LAS CR	Blum, A.	GSFC	Gilcrease, A.	NAS 5-26662	4396
45	NEW MEX ST U-LAS CR	Owens, F. C.	HQ-XE	Jacquez, R. B.	NGT 00-070-113	4407
45	NO CAR A&T STATE U	Weinberg, I.	LERC	Colly, W.	NAG 3-976	4779
45	NO CAROLINA STATE U	Bailey, M. C.	LARC	Kauffman, J. F.	NAG 1-738	4787
45	NO CAROLINA STATE U	Hearn, C. P.	LARC	Trew, R. J.	NAG 1-943	4791
45	NO CAROLINA STATE U	Matus, L. G.	LERC	Davis, R. F.	NAG 3-782	4795
45	NORTHEASTERN UNIV	Bracalente, E. M.	LARC	Raemer, H. R.	NAG 1-734	3890
45	OHIO STATE UNIV	Woo, A. C.	ARC	Burnside, W. D.	NAG 2-542	5010
45	OHIO STATE UNIV	Woo, A. C.	ARC	Chou, R. C.	NCA 2-322	5054
45	OHIO STATE UNIV	Barber, G. C.	LARC	Newman, E. H.	NAG 1-1058	5008
45	OHIO STATE UNIV	Beck, F. B.	LARC	Rudduck, C.	NAS 1-17450	5049
45	OHIO STATE UNIV	Gilreath, M. C.	LARC	Burnside, W. D.	NSG 1498	5067
45	OHIO STATE UNIV	Gilreath, M. C.	LARC	Burnside, W. D.	NSG 1613	5068
45	OHIO STATE UNIV	Heyward, A.	LERC	Reilly, C. H.	NAG 3-159	5012
45	OHIO STATE UNIV	Rice, E. J.	LERC	Pathak, P. H.	NAG 3-476	5014
45	OHIO STATE UNIV	Arth, C. H.	LERC	Gupta, I. J.	NAG 3-536	5015
45	OHIO STATE UNIV	Shaw, R. J.	LERC	Peters, L.	NAG 3-913	5026
45	OHIO STATE UNIV	Rice, E. J.	LERC	Pathak, P. H.	NAG 3-981	5029
45	OHIO STATE UNIV	Bhasin, K. B.	LERC	Valco, G. J.	NCC 3-105	5059
45	OHIO STATE UNIV	Kunath, R. R.	LERC	Burnside, W. D.	NCC 3-145	5060
45	OHIO STATE UNIV	Owens, F. C.	HQ-XE	Valco, G. J.	NGT 00-050-378	5064
45	OHIO STATE UNIV	Owens, F. C.	HQ-XE	Ozguner, U.	NGT 00-050-409	5065
45	OHIO UNIVERSITY	Morrell, F. R.	LARC	McFarland, R. H.	NGR 36-009-017	5075
45	OHIO UNIVERSITY	Owens, F. C.	HQ-XE	Mitchell, J. R.	NGT 00-050-525	5076
45	OLD DOMINION UNIV	Staton, L. D.	LARC	Hibey, J. L.	NAG 1-626	6034
45	OLD DOMINION UNIV	Hayes, P. J.	LARC	Stoughton, J. W.	NAG 1-683	6038
45	OLD DOMINION UNIV	Holmes, H. K.	LARC	McCree, G. J.	NAG 1-735	6040
45	OLD DOMINION UNIV	Gray, D. L.	LARC	Stoughton, J. W.	NCC 1-120	6074
45	OLD DOMINION UNIV	Hayes, P. J.	LARC	Stoughton, W.	NCC 1-136	6076
45	OLD DOMINION UNIV	Owens, F. C.	HQ-XE	Albin, S.	NGT 00-050-395	6083
45	OLD DOMINION UNIV	Owens, F. C.	HQ-XE	McRee, G. J.	NGT 00-070-134	6094
45	OLD DOMINION UNIV	Owens, F. C.	HQ-LE	Stoughton, J. W.	NGT 00-050-080	6077
45	OLD DOMINION UNIV	Owens, F. C.	HQ-LE	Schoenbach, K.	NGT 00-050-115	6078
45	OLD DOMINION UNIV	Owens, F. C.	HQ-LE	Albin, S.	NGT 00-050-118	6079
45	PENN STATE U-UNIV PK	Joshi, S. M.	LARC	Bose, N. K.	NAG 1-969	5283
45	PRAIRIE VIEW A&M U	Arndt, G. D.	JSC	Tolliver, C. L.	NAG 9-318	5569
45	PRINCETON UNIVERSITY	Rhodes, P. H.	MSFC	Saville, D. A.	NAG 8-597	4339
45	PURDUE UNIVERSITY	Truong, L. V.	LERC	Wasynczuk, O.	NAG 3-848	3207
45	PURDUE UNIVERSITY	Owens, F. C.	HQ-LE	Mitchell, O. R.	NGT 00-050-070	3236
45	RENSSELAER POLY-NY	Joshi, S. M.	LARC	Kaufman, H.	NAG 1-515	4623
45	RENSSELAER POLY-NY	Weinberg, I.	LERC	Ghandhi, S. K.	NAG 3-604	4630
45	RICE UNIVERSITY	Owens, F. C.	HQ-XE	De Figueiredo, R.	NGT 00-050-379	5606
45	RICE UNIVERSITY	Owens, F. C.	HQ-XE	Johnson, D. H.	NGT 00-050-447	5607
45	RICE UNIVERSITY	Owens, F. C.	HQ-LE	De Figueiredo, R.	NGT 00-050-071	5604
45	RICE UNIVERSITY	Owens, F. C.	HQ-LE	Johnson, D. H.	NGT 44-006-807	5608
45	SPELMAN COLLEGE	White, B.	HQ	Falconer, E.	NGT 00-090-003	2911
45	STANFORD UNIVERSITY	Grant, T. L.	ARC	Tobagi, F. A.	NAG 2-292	1700
45	STANFORD UNIVERSITY	Lum, H.	ARC	Goodman, J. W.	NCA 2-197	1763
45	STANFORD UNIVERSITY	Ochoa, E.	ARC	Goodman, J. W.	NCA 2-331	1781
45	STANFORD UNIVERSITY	Ochoa, E.	ARC	Widrow, B.	NCA 2-389	1792
45	STANFORD UNIVERSITY	Sebesta, P. D.	ARC	Banks, P.	NCA 2-420	1795
45	STANFORD UNIVERSITY	Jones, H. W.	ARC	Peterson, A. M.	NCC 2-445	1814

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45	STANFORD UNIVERSITY	Magee, C. J.	LARC	Byer, R. L.	NAG 1-182	1689
45	STANFORD UNIVERSITY	Owens, F. C.	HQ-XE	Banks, P. M.	NGT 00-050-151	1841
45	STANFORD UNIVERSITY	Owens, F. C.	HQ-XE	Flynn, M. J.	NGT 00-050-386	1848
45	STANFORD UNIVERSITY	Owens, F. C.	HQ-XE	Franklin, G. F.	NGT 00-050-431	1850
45	STANFORD UNIVERSITY	Owens, F. C.	HQ-XE	Eshleman, V. R.	NGT 00-070-056	1855
45	STANFORD UNIVERSITY	Owens, F. C.	HQ-LE	Banks, P. M.	NGT 00-050-016	1839
45	STATE UNIV NY-BUFFAL	Nimmo, N. A.	LARC	Inman, D. J.	NAG 1-993	4688
45	STATE UNIV NY-BUFFAL	Myers, I.	LERC	Laghari, J. R.	NAG 3-1019	4694
45	TEXAS A&I UNIVERSITY	Owens, F. C.	HQ-XE	Linder, J. S.	NGT 00-070-132	5618
45	TEXAS A&I UNIVERSITY	Owens, F. C.	HQ-XE	Linder, J. S.	NGT 00-070-133	5619
45	TEXAS A&M UNIVERSITY	Hackler, I. M.	JSC	Russell, B. D.	NAG 9-143	5649
45	TEXAS A&M UNIVERSITY	Williams, R. J.	JSC	Pandey, R. K.	NAG 9-150	5651
45	TEXAS A&M UNIVERSITY	Darcy, E.	JSC	White, R. E.	NAG 9-177	5653
45	TEXAS A&M UNIVERSITY	Owens, F. C.	HQ-XE	Painter, J. H.	NGT 00-050-401	5693
45	TEXAS A&M UNIVERSITY	Owens, F. C.	HQ-XE	Russell, D.	NGT 00-070-082	5696
45	TEXAS SOUTHERN UNIV	Owens, F. C.	HQ-XE	Kristiansen, M.	NGT 00-050-506	5706
45	TUSKEGEE UNIVERSITY	Randall, J. L.	MSFC	Doreswamy, C. V.	NAG 8-40	1062
45	UNIV OF AKRON	Lee, R. Q.	LERC	Lee, K. F.	NCC 3-102	5102
45	UNIV OF AKRON	Acosta, R. J.	LERC	Ida, N.	NCC 3-146	5105
45	UNIV ALA-HUNTSVILLE	Edge, T. M.	MSFC	Ho, F. D.	NAG 8-96	1106
45	UNIV ALA-HUNTSVILLE	Edge, T.	MSFC	Ho, F. D.	NAG 8-108	1110
45	UNIV ARKANSAS-FAYETV	Weizer, V. G.	LERC	Hermann, A. M.	NAG 3-802	1487
45	UNIV ARKANSAS-FAYETV	Weizer, V. G.	LERC	Hermann, A. M.	NAG 3-920	1488
45	UNIV CALIF-BERKELEY	Bailey, S. G.	LERC	Weber, E. R.	NAG 3-857	1873
45	UNIV CALIF-DAVIS	Budinger, J. M.	LERC	Fehér, K.	NAG 3-1007	2011
45	UNIV CALIF-L ANGELES	Joshi, S. M.	LARC	Balakrishnan, A. V.	NAG 1-464	2059
45	UNIV CALIF-SAN DIEGO	Alterovitz, S. A.	LERC	Luo, H. L.	NAG 3-1015	2176
45	UNIV OF CINCINNATI	Whyte, W. A.	LERC	Ramamoorthy, P. A.	NAG 3-582	5115
45	UNIV OF CINCINNATI	Krawczonek, W. M.	LERC	Kapoor, V. J.	NAG 3-807	5117
45	UNIV OF CINCINNATI	Sundberg, G. R.	LERC	Henderson, H. T.	NSG 3022	5136
45	UNIV OF CINCINNATI	Owens, F. C.	HQ-XE	Kapoor, V. J.	NGT 00-050-492	5131
45	UNIV OF CINCINNATI	Owens, F. C.	HQ-XE	Rubin, S. G.	NGT 00-070-151	5135
45	UNIV OF CINCINNATI	Owens, F. C.	HQ-LE	Kapoor, V. J.	NGT 00-050-086	5129
45	UNIV HOUSTON-HOUSTON	Krishen, K.	JSC	Wolfe, J. C.	NAG 9-277	5726
45	UNIV HOUSTON-HOUSTON	Lichtenberg, C.	JSC	Wolfe, J. C.	NAG 9-352	5730
45	UNIV HOUSTON-HOUSTON	Sunkel, J. W.	JSC	Shieh, L. S.	NAG 9-380	5733
45	UNIV HOUSTON-HOUSTON	Sunkel, J. W.	JSC	Shieh, L. S.	NAG 9-385	5734
45	UNIV OF IDAHO	Miller, W.	GSFC	Maki, G. K.	NAS 5-26534	2985
45	UNIV ILLINOIS-CHICGO	Woo, A. C.	ARC	Uslenghi, P. L.	NAG 2-544	3096
45	UNIV ILLINOIS-CHICGO	Handschuh, R. F.	LERC	Litvin, F. L.	NAG 3-964	3101
45	UNIV ILLINOIS-URBANA	Abshire, J. B.	GSFC	Gardner, C. S.	NSG 5049	3165
45	UNIV ILLINOIS-URBANA	Acosta, R. J.	LERC	Lee, S. W.	NAG 3-419	3116
45	UNIV ILLINOIS-URBANA	Rice, E. J.	LERC	Lee, S. W.	NAG 3-475	3117
45	UNIV ILLINOIS-URBANA	Alterovitz, S. A.	LERC	Morkoc, H.	NAG 3-613	3119
45	UNIV ILLINOIS-URBANA	Owens, F. C.	HQ-XE	Lee, S. W.	NGT 00-070-038	3160
45	UNIV ILLINOIS-URBANA	Owens, F. C.	HQ-XE	Lo, Y. T.	NGT 00-070-042	3162
45	UNIV ILLINOIS-URBANA	Owens, F. C.	HQ-XE	Kushner, M. J.	NGT 00-070-107	3163
45	UNIV OF IOWA	Owens, F. C.	HQ-XE	Robinson, J.	NGT 00-050-250	3343
45	UNIV OF KANSAS	Owens, F. C.	HQ-XE	Moore, R. K.	NGT 00-050-285	3375
45	UNIV OF KANSAS	Owens, F. C.	HQ-XE	Moore, R. K.	NGT 00-050-286	3376
45	UNIV OF KANSAS	Owens, F. C.	HQ-XE	Moore, R. K.	NGT 00-050-317	3377
45	UNIV OF KANSAS	Owens, F. C.	HQ-XE	Demarest, K. R.	NGT 00-050-408	3378
45	UNIV OF KANSAS	Owens, F. C.	HQ-XE	Moore, R. K.	NGT 00-050-464	3379
45	UNIV MARYLAND-COL PK	Dorband, J. E.	GSFC	Ja Ja, J.	NAG 5-776	3535
45	UNIV MARYLAND-COL PK	Glenar, D. A.	GSFC	Zaki, K. A.	NAG 5-1002	3550
45	UNIV MARYLAND-COL PK	Alexander, J. K.	HQ-E	Richard, J. P.	NAGW 1614	3588
45	UNIV MD-EASTRN SHORE	Menchan, D.	GSFC	Muller, R. E.	NCA 5-99	3639
45	UNIV OF MASS-AMHERST	Lum, H.	ARC	Chlamtac, I.	NAG 2-578	3903
45	UNIV OF MASS-AMHERST	Le Vine, D. M.	GSFC	Swift, C. T.	NAS 5-29385	3919
45	UNIV OF MASS-AMHERST	Alexander, J. K.	HQ-E	Yngvesson, K. S.	NAGW 1659	3917

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45	UNIV OF MASS-AMHERST	Owens, F. C.	HQ-XE	McIntosh, R. E.	NGT 00-050-485	3925
45	UNIV OF MASS-AMHERST	Owens, F. C.	HQ-XE	McIntosh, R. E.	NGT 00-070-037	3928
45	UNIV OF MASS-AMHERST	Owens, F. C.	HQ-LE	Swift, C. T.	NGT 00-050-038	3922
45	UNIV MICH-ANN ARBOR	Woo, A. C.	ARC	Volakis, J. L.	NAG 2-541	3989
45	UNIV MICH-ANN ARBOR	Dickman, J. E.	LERC	Haddad, G. I.	NAG 3-618	3991
45	UNIV MICH-ANN ARBOR	Alterovitz, S. A.	LERC	Bhattacharga, P. K.	NAG 3-988	3997
45	UNIV MICH-ANN ARBOR	Bhasin, K. B.	LERC	Mourou, G. M.	NCC 3-130	4070
45	UNIV MICH-ANN ARBOR	Owens, F. C.	HQ-XE	Ulaby, F. T.	NGT 00-050-330	4081
45	U MINN-MNPLS-ST PAUL	Lum, H.	ARC	Slagle, J. R.	NCC 2-497	4127
45	U MINN-MNPLS-ST PAUL	Kaiser, M. L.	GSFC	Kellogg, P. J.	NAS 5-28574	4121
45	UNIV NEBRASKA-LINCLN	Jaworske, D. A.	LERC	Woolam, J. A.	NAG 3-95	4235
45	UNIV NEBRASKA-LINCLN	Whyte, W. A.	LERC	Sayood, K.	NAG 3-806	4237
45	UNIV N CAR-CHARLOTTE	Armstrong, E. S.	LARC	Kakad, Y. P.	NAG 1-535	4831
45	UNIV OF NOTRE DAME	Owens, F. C.	HQ-XE	Costello, D. J.	NGT 00-070-109	3257
45	UNIV OF PITTSBURGH	Schwarze, G. E.	LERC	Wieserman, W. R.	NAG 3-945	5400
45	U PUERTO RICO-MAYAGZ	Owens, F. C.	HQ-XE	Alvarez, J.	NGT 00-050-255	6474
45	U PUERTO RICO-MAYAGZ	Owens, F. C.	HQ-XE	Vasquez, R. E.	NGT 00-070-149	6477
45	U PUERTO RICO-MAYAGZ	Owens, F. C.	HQ-XE	Vasquez, R. E.	NGT 00-070-150	6478
45	UNIV OF REDLANDS	Hendricks, H. D.	LARC	Wang, S.	NAG 1-580	2336
45	UNIV OF ROCHESTER	Bhasin, K. B.	LERC	Dykaar, D.	NCC 3-107	4748
45	UNIV OF SOUTHERN CAL	Budinger, J. M.	LERC	Welch, L. R.	NAG 3-982	2357
45	UNIV TENNESSEE-KNOXV	Lollar, L. F.	MSFC	Lee, S.	NAG 8-721	5513
45	UNIV TEXAS-ARLINGTON	Owens, F. C.	HQ-XE	Fung, A. K.	NGT 00-050-500	5760
45	UNIV TEXAS-AUSTIN	Zaman, A. J.	LERC	Ling, H.	NCC 3-127	5832
45	UNIV OF TOLEDO	Whyte, W. A.	LERC	Kwatra, S. C.	NAG 3-42	5142
45	UNIV OF TOLEDO	Schwarze, G. E.	LERC	Stuart, T. A.	NAG 3-708	5147
45	UNIV OF TOLEDO	Budinger, J. M.	LERC	Kwatra, S. C.	NAG 3-799	5151
45	UNIV OF TOLEDO	Budinger, J. M.	LERC	Kwatra, S. C.	NAG 3-865	5152
45	UNIV OF TOLEDO	Gruber, R. P.	LERC	Stuart, T. A.	NAG 3-959	5155
45	UNIV OF TOLEDO	Andro, M.	LERC	Smith, E. D.	NAG 3-1036	5157
45	UNIV OF TOLEDO	Lee, R. O.	LERC	Lee, K. F.	NCC 3-126	5169
45	UNIV OF UTAH	Heighway, J.	LERC	Grow, R. W.	NAG 3-327	5930
45	UNIV OF VIRGINIA	Bennett, C. L.	GSFC	Mattauch, R. J.	NAG 5-712	6114
45	UNIV OF VIRGINIA	Owens, F. C.	HQ-XE	Inigo, R. M.	NGT 00-050-125	6143
45	UNIV OF WASHINGTON	Hirata, J. H.	ARC	Alexandro, F. J.	NCA 2-278	6324
45	UNIV OF WASHINGTON	Hueschen, R. M.	LARC	Loily, U.	NAG 1-913	6254
45	UNIV WISC-MADISON	Sundberg, G. R.	LERC	Lipo, T. A.	NAG 3-786	6379
45	UNIV WISC-MADISON	Myers, I. T.	LERC	Divan, D. M.	NAG 3-804	6380
45	UNIV WISC-MADISON	Burrows, L. M.	LERC	Lipo, T. A.	NAG 3-940	6381
45	VANDERBILT UNIVERSTY	Fernandez, K. R.	MSFC	Cook, G. E.	NAG 8-116	5533
45	VIRGINIA POLY INST	Parsons, C. L.	GSFC	Brown, G. S.	NAG 5-636	6210
45	VIRGINIA POLY INST	Parsons, C. L.	GSFC	Brown, G. S.	NAG 5-648	6211
45	VIRGINIA POLY INST	Parsons, C. L.	GSFC	Brown, G. S.	NAG 5-659	6212
45	VIRGINIA POLY INST	Davis, R. M.	KSC	Riad, S. M.	NAG10-54	6220
45	VIRGINIA POLY INST	Staton, L. D.	LARC	Brown, G. S.	NAG 1-754	6178
45	VIRGINIA POLY INST	Rogowski, R. S.	LARC	Claus, R. O.	NAG 1-780	6181
45	VIRGINIA POLY INST	Bailey, M. C.	LARC	Stutzman, W. L.	NAG 1-859	6186
45	VIRGINIA POLY INST	Rogowski, R. S.	LARC	Claus, R. O.	NAG 1-895	6189
45	VIRGINIA POLY INST	Rogowski, R. S.	LARC	Claus, R. O.	NAG 1-1043	6200
45	VIRGINIA POLY INST	Owens, F. C.	HQ-XE	Lindner, D.	NGT 00-050-004	6230
45	VIRGINIA POLY INST	Owens, F. C.	HQ-XE	Stutzman, W.	NGT 00-050-413	6239
45	WASHINGTON ST UNIV	Owens, F. C.	HQ-LE	Hower, G.	NGT 00-050-075	6350
45	WAYNE STATE UNIV	Brinker, D. J.	LERC	Woodyard, J. R.	NAG 3-833	4094
46	ALABAMA A&M UNIV	Randall, J. L.	MSFC	Hurford, G. J.	NAG 8-23	1000
46	ALABAMA A&M UNIV	Randall, J. L.	MSFC	Venkateswarly, P.	NAG 8-29	1003
46	ARIZONA STATE UNIV	Maddalon, D. V.	LARC	Saric, W. S.	NAG 1-1032	1229
46	ARIZONA STATE UNIV	Fleming, D. P.	LERC	Nelson, H. D.	NAG 3-580	1233
46	ARIZONA STATE UNIV	Simon, F. F.	LERC	Metzger, D. E.	NAG 3-623	1234
46	ARIZONA STATE UNIV	Salzman, J. A.	LERC	Neitzel, G. P.	NAG 3-1054	1237
46	AUBURN UNIV-AUBURN	Fox, T. H.	MSFC	Zalik, R. A.	NAG 8-119	1026

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46	AUBURN UNIV-AUBURN	Guest, S. H.	MSFC	Crocker, M. J.	NAS 8-36146	1038
46	AUBURN UNIV-AUBURN	Lee, J. E.	MSFC	Zee, R. H.	NAS 8-38083	1043
46	AUBURN UNIV-AUBURN	Owens, F. C.	HQ-XE	Crocker, M. J.	NGT 00-050-361	1051
46	BROWN UNIVERSITY	Housner, J. M.	LARC	Ortiz, M.	NAG 1-634	5416
46	CALIF INST OF TECH	Stinson, H. P.	MSFC	Brennen, C. E.	NAG 8-118	1517
46	CAL STATE U-LG BEACH	Townsend, D. P.	LERC	Akin, L.	NAG 3-20	1607
46	CARNEGIE-MELLON UNIV	Hendricks, R. C.	LERC	Hughes, W. F.	NAG 3-166	5226
46	CARNEGIE-MELLON UNIV	Lawrence, C.	LERC	Desa, S.	NAG 3-811	5229
46	CARNEGIE-MELLON UNIV	Nguyen, H. L.	LERC	Ramos, J. I.	NAG 3-1009	5232
46	CARNEGIE-MELLON UNIV	Owens, F. C.	HQ-XE	Chyu, M. K.	NGT 00-050-436	5244
46	CASE WESTERN RESERVE	O'brien, J. E.	LERC	Reshotko, E.	NAG 3-230	4847
46	CASE WESTERN RESERVE	Acosta, W. A.	LERC	Dybbs, A.	NAG 3-467	4851
46	CASE WESTERN RESERVE	Radil, K. C.	LERC	Mullen, R. L.	NAG 3-653	4857
46	CASE WESTERN RESERVE	Liebert, C. H.	LERC	Dybbs, A.	NAG 3-686	4858
46	CASE WESTERN RESERVE	Lawrence, C.	LERC	Quinn, R. D.	NAG 3-761	4868
46	CASE WESTERN RESERVE	Simoneau, R. J.	LERC	Reshotko, E.	NAG 3-932	4886
46	CASE WESTERN RESERVE	Capaldi, R. J.	LERC	Adams, M. L.	NAG 3-980	4889
46	CASE WESTERN RESERVE	Berke, L.	LERC	Sobajic, D. J.	NAG 3-1003	4890
46	CASE WESTERN RESERVE	Brewe, D. E.	LERC	Prahl, J. M.	NCC 3-30	4900
46	CASE WESTERN RESERVE	Marek, C. J.	LERC	Tien, J. S.	NCC 3-87	4910
46	CASE WESTERN RESERVE	Vernon, R. W.	LERC	Kamotani, Y.	NCC 3-140	4927
46	CASE WESTERN RESERVE	Owens, F. C.	HQ-LE	T'ien, J. S.	NGT 00-050-088	4932
46	CATHOLIC UNIVERSITY	Osborne, E. P.	GSFC	Baz, A. M.	NAG 5-520	2636
46	CATHOLIC UNIVERSITY	Fedor, J. V.	GSFC	Baz, A. M.	NAG 5-1037	2643
46	CATHOLIC UNIVERSITY	Bohlin, J. D.	HQ-ES	Whang, Y. C.	NAGW 1323	2648
46	CENTRAL ST UNIV-OHIO	Kan, E. P.	JPL	Grisson, W. A.	NAGW 1336	4941
46	CITY COLLEGE OF N Y	Owens, F. C.	HQ-XE	Raj, R.	NGT 00-070-046	4436
46	CLEMSON UNIV-CLEMSON	Howard, F. S.	KSC	Kumar, R.	NAG10-56	5463
46	CLEMSON UNIV-CLEMSON	Johnson, W. S.	LARC	Goree, J. G.	NAG 1-971	5458
46	CLEMSON UNIV-CLEMSON	Reid, L.	LERC	Wu, C. H.	NAG 3-1072	5460
46	CLEVELAND STATE UNIV	Manderscheid, J. M.	LERC	Pintz, A.	NAG 3-879	4951
46	CLEVELAND STATE UNIV	McAleese, J. D.	LERC	Bosela, P.	NAG 3-1008	4956
46	CLEVELAND STATE UNIV	Presler, A. F.	LERC	Alkasab, K. A.	NCC 3-17	4960
46	CLEVELAND STATE UNIV	Trudell, J. J.	LERC	Evans, A. L.	NCC 3-50	4968
46	CLEVELAND STATE UNIV	Marek, C. J.	LERC	Ghorashi, B.	NCC 3-100	4981
46	COLORADO STATE UNIV	McCoy, J. E.	JSC	Wilbur, P. J.	NAG 9-120	2392
46	COLORADO STATE UNIV	Rawlin, V. K.	LERC	Wilbur, P. J.	NGR 06-002-112	2398
46	COLORADO STATE UNIV	Campbell, W.	MSFC	Sandborn, V. A.	NAS 8-36354	2396
46	COLORADO STATE UNIV	Owens, F. C.	HQ-XE	Wilbur, P. J.	NGT 00-050-370	2400
46	COLUMBIA UNIVERSITY	Owens, F. C.	HQ-XE	Longman, R.	NGT 00-050-257	4505
46	CORNELL UNIVERSITY	Queen, E. M.	LARC	Psiaki, M. L.	NAG 1-1009	4510
46	CORNELL UNIVERSITY	Haggard, J. B.	LERC	Avedisian, C. T.	NAG 3-987	4521
46	DARTMOUTH COLLEGE	Owens, F. C.	HQ-XE	Kennedy, F.	NGT 00-050-376	4276
46	DREXEL UNIVERSITY	Steinetz, B. M.	LERC	Ko, F. K.	NAG 3-1059	5249
46	DUKE UNIVERSITY	Shepherd, K. P.	LARC	Dowell, E. A.	NAG 1-709	4753
46	DUKE UNIVERSITY	Shepherd, K. P.	LARC	Bliss, D. B.	NAG 1-722	4754
46	DUKE UNIVERSITY	Brown, G. V.	LERC	Knight, J. D.	NAG 3-968	4756
46	DUKE UNIVERSITY	Owens, F. C.	HQ-XE	Bliss, D.	NGT 00-050-169	4763
46	DUKE UNIVERSITY	Owens, F. C.	HQ-XE	Dowell, E. H.	NGT 00-050-342	4764
46	DUKE UNIVERSITY	Owens, F. C.	HQ-XE	Cocks, F. H.	NGT 00-050-459	4766
46	EASTERN KENTUCKY U	Fishman, G. J.	MSFC	Laird, C. E.	NAS 8-36649	3384
46	FLORIDA A&M UNIV	Alterescu, S.	GSFC	Fresh, F. A.	NAS 5-25165	2715
46	FLORIDA ATLANTIC U	Metcalf, V. L.	LARC	Cuschieri, J. M.	NAG 1-685	2720
46	FLORIDA ATLANTIC U	Marrill, W. C.	LERC	Duyar, A.	NAG 3-1006	2722
46	FLORIDA INST OF TECH	Gill, U. S.	MSFC	Frankel, J. I.	NAG 8-109	2726
46	GEORGE WASHINGTON U	Swanson, T. D.	GSFC	Kiper, A. M.	NAG 5-834	2667
46	GEORGE WASHINGTON U	Robinson, M. P.	LARC	Liebowitz, H.	NAG 1-852	2660
46	GEORGE WASHINGTON U	Salzman, J. A.	LERC	Dressler, R. F.	NAG 3-883	2663
46	GEORGIA INST OF TECH	Fralick, G. C.	ARC	Forney, L. J.	NCC 3-135	2895
46	GEORGIA INST OF TECH	Camarda, C. J.	LARC	Colwell, G. T.	NAG 1-392	2839

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46	GEORGIA INST OF TECH	Soloway, D.	LARC	Book, W. J.	NAG 1-623	2843
46	GEORGIA INST OF TECH	Owens, F. C.	HQ-XE	Lipkin, H.	NGT 00-050-369	2897
46	HOWARD UNIVERSITY	Housner, J. M.	LARC	Broome Jr., T. H.	NAG 1-383	2687
46	HOWARD UNIVERSITY	Owens, F. C.	HQ-LE	Broome, T. H.	NGT 00-050-109	2703
46	INDIANA U-BLOOMINGTN	Dustin, M. O.	LERC	Bair, E. J.	NAG 3-1014	3174
46	IOWA STATE UNIV	Van Dalsem, W. R.	ARC	Pletcher, R. H.	NCA 2-174	3280
46	IOWA STATE UNIV	Bill, R. C.	LERC	Van Gerpen, J. H.	NAG 3-957	3268
46	IOWA STATE UNIV	Owens, F. C.	HQ-XE	Okiishi, T. H.	NGT 00-050-137	3287
46	IOWA STATE UNIV	Owens, F. C.	HQ-LB	Pletcher, R. H.	NGT 16-002-802	3291
46	JACKSON STATE UNIV	Rhodes, M. D.	LARC	Brewer, W. V.	NAG 1-860	4142
46	JOHNS HOPKINS UNIV	Owens, F. C.	HQ-XE	Prosperetti, A.	NGT 00-050-486	3491
46	LAMAR UNIVERSITY	Chandler, J. A.	JSC	Corder, P. R.	NAG 9-300	5564
46	LEHIGH UNIVERSITY	Bigelow, C. A.	LARC	Erdogan, F.	NAG 1-713	5260
46	LA ST U&A&M COL-BRGE	Holst, T. L.	ARC	Acharya, S.	NCA 2-326	3410
46	LOUISIANA TECH UNIV	Hoffman, W. C.	JSC	Callens, E. E.	NAG 9-176	3412
46	MASS INST OF TECH	Harrison, F. W.	LARC	Dubowsky, S.	NAG 1-801	3717
46	MASS INST OF TECH	Hasan, M. M.	LERC	Sonin, A. A.	NAG 3-731	3739
46	MASS INST OF TECH	Tew, R. C.	LERC	Smith, J. L.	NAG 3-1076	3750
46	MASS INST OF TECH	Wilmer, G.	MSFC	Sanchez, M. M.	NAS 8-35018	3843
46	MASS INST OF TECH	Owens, F. C.	HQ-XE	Sheridan, T.	NGT 00-050-145	3867
46	MASS INST OF TECH	Owens, F. C.	HQ-XE	Dubowsky, S.	NGT 00-050-364	3872
46	MASS INST OF TECH	Owens, F. C.	HQ-XE	Toum, K. Y.	NGT 00-050-438	3873
46	MASS INST OF TECH	Owens, F. C.	HQ-XE	Williams, J. H.	NGT 00-070-066	3876
46	MASS INST OF TECH	Owens, F. C.	HQ-XE	Williams, J. H.	NGT 00-070-067	3877
46	MASS INST OF TECH	Owens, F. C.	HQ-LE	Dubowsky, S.	NGT 00-070-012	3874
46	MEMPHIS ST UNIV	Oswald, F. B.	LERC	Lin, H. H.	NAG 3-961	5494
46	MICHIGAN STATE UNIV	Nguyen, H. L.	LERC	Shock, H. J.	NAG 3-853	3962
46	MICHIGAN TECH UNIV	McKissick, B. T.	LARC	Trevino, G.	NAG 1-717	3968
46	MICHIGAN TECH UNIV	McQuillen, J.	LERC	Suryanarayana, N. V.	NAG 3-711	3972
46	NEW MEX ST U-LAS CR	Owens, F. C.	HQ-XE	Hills, R. G.	NGT 00-070-070	4405
46	NO CAR A&T STATE U	Witcofski, R. D.	LARC	Sharpe, L.	NAG 1-892	4775
46	NORTHWESTERN UNIV	Housner, J. M.	LARC	Belytschko, T. B.	NAG 1-650	2991
46	OHIO STATE UNIV	Van Dalsem, W. P.	ARC	Nakamura, S.	NCA 2-298	5053
46	OHIO STATE UNIV	Perez, S. E.	LARC	Leissa, A. W.	NAG 1-988	5007
46	OHIO STATE UNIV	Zaman, K. Q.	LERC	Samimy, M.	NAG 3-764	5019
46	OHIO STATE UNIV	Zakrajsek, J. J.	LERC	Houser, D. R.	NAG 3-773	5020
46	OHIO STATE UNIV	Lawrence, C.	LERC	Leissa, A. W.	NAG 3-880	5025
46	OHIO STATE UNIV	Meyer, M. B.	LERC	Brodkey, R. S.	NAG 3-1039	5035
46	OHIO STATE UNIV	Owens, F. C.	HQ-XE	Herbert, T.	NGT 00-050-259	5063
46	OHIO UNIVERSITY	Kiraly, L. J.	LERC	Akl, F. A.	NAG 3-762	5072
46	OHIO UNIVERSITY	Brown, G. V.	LERC	Akl, F. A.	NAG 3-970	5074
46	OLD DOMINION UNIV	Storaasli, O. O.	LARC	Razzag, Z.	NAG 1-438	6030
46	OLD DOMINION UNIV	Owens, F. C.	HQ-XE	Britcher, C. P.	NGT 00-050-260	6081
46	OLD DOMINION UNIV	Owens, F. C.	HQ-XE	Mei, C.	NGT 00-070-020	6086
46	PENN STATE U-UNIV PK	Horstman, C. C.	ARC	Settles, G. S.	NCA 2-192	5349
46	PENN STATE U-UNIV PK	Horstman, C. C.	ARC	Settles, G. S.	NCA 2-235	5350
46	PENN STATE U-UNIV PK	Delaat, J. C.	LERC	Ray, A.	NAG 3-823	5297
46	PENN STATE U-UNIV PK	Grodsindky, C. M.	LERC	Singha, A.	NAG 3-949	5299
46	PENN STATE U-UNIV PK	Hippensteele, S. A.	LERC	Camci, C.	NAG 3-989	5301
46	PENN STATE U-UNIV PK	Aukerman, C. A.	LERC	Turns, S. R.	NAG 3-1044	5304
46	PENN STATE U-UNIV PK	Walker, J. F.	LERC	Carpino, M.	NAG 3-1052	5305
46	PENN STATE U-UNIV PK	Owens, F. C.	HQ-XE	Koopmann, G. H.	NGT 00-050-265	5360
46	PENN STATE U-UNIV PK	Owens, F. C.	HQ-XE	Settles, G. S.	NGT 00-050-400	5365
46	PENN STATE U-UNIV PK	Owens, F. C.	HQ-XE	Settles, G. S.	NGT 00-050-495	5367
46	POLYTECHNIC U	Housner, J. M.	LARC	Kozin, F.	NAG 1-986	4617
46	PRAIRIE VIEW A&M U	Pohly, J.	HQ-U	Fanale, F. P.	NGT 44-003-900	5573
46	PRINCETON UNIVERSITY	Owens, F. C.	HQ-XE	Dryer, F. L.	NGT 00-050-373	4361
46	PURDUE UNIVERSITY	Miura, H.	ARC	Rao, S. S.	NCA 2-223	3230
46	PURDUE UNIVERSITY	Bigelow, C. A.	LARC	Sun, C. T.	NAG 1-825	3195
46	PURDUE UNIVERSITY	Weidner, J. P.	LARC	Thompson, H. D.	NAG 1-854	3196

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46	PURDUE UNIVERSITY	Rollbuhler, R. J.	LERC	Lefebvre, A. F.	NAG 3-552	3203
46	PURDUE UNIVERSITY	Owens, F. C.	HQ-XE	Viskanta, R.	NGT 00-050-207	3240
46	PURDUE UNIVERSITY	Owens, F. C.	HQ-LE	Incropera, F. P.	NGT 00-050-011	3234
46	RENSSELAER POLY-NY	Owens, F. C.	HQ-XE	Lauderbaugh, L. K.	NGT 00-050-418	4648
46	RENSSELAER POLY-NY	Owens, F. C.	HQ-XE	Lauderbaugh, L. K.	NGT 00-050-505	4650
46	RICE UNIVERSITY	Palais, B. G.	JSC	Angel, Y. C.	NAG 9-349	5592
46	RICE UNIVERSITY	Galicki, P.	JSC	Cheatham, J. B.	NAG 9-372	5595
46	RICE UNIVERSITY	Berka, R. B.	JSC	Spanos, P. D.	NAG 9-392	5596
46	ROSE-HULMAN INST TEC	Brown, G. V.	LERC	North, C. M.	NAG 3-868	3246
46	SANTA CLARA UNIV	Kutler, P.	ARC	Hight, T. K.	NCA 2-282	2347
46	SANTA CLARA UNIV	Kutler, P.	ARC	Hight, T.	NCA 2-380	2348
46	SANTA CLARA UNIV	Strawa, A. W.	ARC	Yip, T. G.	NCA 2-401	2349
46	STANFORD UNIVERSITY	Johnson, D. A.	ARC	Eaton, J. K.	NCA 2-265	1770
46	STANFORD UNIVERSITY	Kim, J.	ARC	Ferziger, J. H.	NCA 2-285	1774
46	STANFORD UNIVERSITY	Lemke, L. G.	ARC	Barkan, P.	NCA 2-302	1777
46	STANFORD UNIVERSITY	Black, D. C.	ARC	Barkan, P.	NCA 2-308	1778
46	STANFORD UNIVERSITY	Zilliac, G.	ARC	Bradshaw, P.	NCA 2-434	1798
46	STANFORD UNIVERSITY	Rogallo, R. F.	ARC	Moin, P.	NCC 2-460	1815
46	STANFORD UNIVERSITY	Stokes, L.	JSC	Leifer, L. J.	NAG 9-262	1725
46	STANFORD UNIVERSITY	Drummond, J. P.	LARC	Ferziger, J. H.	NAG 1-532	1691
46	STANFORD UNIVERSITY	Gaugler, R. E.	LERC	Moffat, R. J.	NAG 3-522	1705
46	STANFORD UNIVERSITY	Anderson, R. C.	LERC	Hanson, R. K.	NAG 3-990	1709
46	STANFORD UNIVERSITY	Carney, L. M.	LERC	Cappelli, M. A.	NAG 3-1040	1710
46	STANFORD UNIVERSITY	Owens, F. C.	HQ-XE	Bradshaw, P.	NGT 00-050-445	1851
46	STANFORD UNIVERSITY	Owens, F. C.	HQ-XE	Franklin, G. F.	NGT 00-050-511	1853
46	STATE UNIV NY-ALBANY	Owens, F. C.	HQ-LE	Rae, W. J.	NGT 33-183-805	4675
46	STATE U NY-BINGHAMTN	Powell, C. A.	LARC	Miles, R. N.	NAG 1-978	4676
46	STATE UNIV NY-BUFFAL	Owens, F. C.	HQ-LB	Inman, D. J.	NGT 33-183-802	4702
46	STATE UNIV NY-BUFFAL	Owens, F. C.	HQ-LE	Liu, C. S.	NGT 00-050-085	4698
46	SYRACUSE UNIVERSITY	O'Brien, J. E.	LERC	Legraff, J. E.	NAG 3-621	4738
46	SYRACUSE UNIVERSITY	Telesman, J.	LERC	Liu, H. W.	NAG 3-837	4739
46	TEMPLE UNIVERSITY	Simon, F. F.	LERC	Lin, A.	NAG 3-1002	5376
46	TEXAS A&M UNIVERSITY	Lin, C. H.	JSC	Peterson, G. P.	NAG 9-276	5659
46	TEXAS A&M UNIVERSITY	Sunkel, J. W.	JSC	Parlos, A. G.	NAG 9-347	5664
46	TEXAS A&M UNIVERSITY	Johnson, D. A.	JSC	Oriels, M. R.	NAG 9-362	5666
46	TEXAS A&M UNIVERSITY	Monford, L.	JSC	Driels, M. R.	NAG 9-374	5667
46	TEXAS A&M UNIVERSITY	Harris, C. E.	LARC	Allen, D. H.	NAG 1-979	5634
46	TEXAS A&M UNIVERSITY	Hendricks, R. C.	LERC	Childs, D. W.	NAG 3-181	5637
46	TEXAS A&M UNIVERSITY	Kascak, A. F.	LERC	Palazzolo, A. B.	NAG 3-763	5641
46	TEXAS A&M UNIVERSITY	Kascak, A. F.	LERC	Palazzolo, A. B.	NAG 3-891	5643
46	TEXAS A&M UNIVERSITY	Fox, T. A.	MSFC	Noah, S. T.	NAS 8-36293	5676
46	TULANE UNIVERSITY	Calomino, A. M.	LERC	Rubinstein, A. A.	NAG 3-815	3422
46	TUSKEGEE UNIVERSITY	Owens, F. C.	HQ-LE	Jeelani, S.	NGT 00-050-130	1072
46	UNIV OF AKRON	Chamis, C. C.	LERC	Padovan, J.	NAG 3-54	5081
46	UNIV OF AKRON	Lewicki, D. G.	LERC	Savage, M.	NAG 3-55	5082
46	UNIV OF AKRON	Zakrajsek, J. J.	LERC	Choy, F. K.	NAG 3-900	5092
46	UNIV OF AKRON	Bobula, G.	LERC	Braun, M. J.	NAG 3-969	5097
46	UNIV OF AKRON	Coe, H. H.	LERC	Savage, M.	NAG 3-1047	5099
46	UNIV OF AKRON	Capaldi, R. J.	LERC	Braun, M. J.	NAG 3-1071	5100
46	UNIV OF AKRON	Russell, L. M.	LERC	Braun, M. L.	NCC 3-93	5101
46	UNIV OF AKRON	Rosenthal, B. N.	LERC	Batur, C.	NCC 3-150	5106
46	UNIV ALA-HUNTSVILLE	Tygielski, P. J.	MSFC	Guinn, G. R.	NCC 8-4	1180
46	UNIV ALA-HUNTSVILLE	Owens, F. C.	HQ-XE	Goldberg, D. E.	NGT 00-050-224	1187
46	UNIV OF ARIZONA	Owens, F.	HQ-LE	Fasel, H.	NGT 03-002-809	1471
46	UNIV CALIF-BERKELEY	Holst, T. L.	ARC	Holt, M.	NCA 2-209	1943
46	UNIV CALIF-BERKELEY	Deiwert, G. S.	ARC	Holt, M.	NCA 2-249	1946
46	UNIV CALIF-BERKELEY	Chaussee, D.	ARC	Holt, M.	NCA 2-275	1948
46	UNIV CALIF-BERKELEY	Deiwert, G. S.	ARC	Holt, M.	NCA 2-419	1956
46	UNIV CALIF-BERKELEY	Strawa, A.	ARC	Holt, M.	NCA 2-446	1958
46	UNIV CALIF-BERKELEY	White, S.	ARC	Eibeck, P.	NCA 2-451	1959

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46	UNIV CALIF-BERKELEY	Stocker, D. P.	LERC	Pello, A. C.	NAG 3-861	1874
46	UNIV CALIF-BERKELEY	Bergstralh, J. T.	HQ-EL	Marcus, P. S.	NAGW 1349	1909
46	UNIV CALIF-BERKELEY	Owens, F. C.	HQ-XE	Daily, J.	NGT 00-050-385	1989
46	UNIV CALIF-DAVIS	Kwak, D.	ARC	Hafez, M. M.	NCA 2-210	2023
46	UNIV CALIF-DAVIS	Kwak, D.	ARC	Hafez, M. M.	NCA 2-410	2027
46	UNIV CALIF-DAVIS	White, S.	ARC	Hafez, M. M.	NCA 2-450	2030
46	UNIV CALIF-DAVIS	Vanoverbeke, T.	LERC	Kollman, W.	NAG 3-667	2009
46	UNIV CALIF-IRVINE	Davy, W. C.	ARC	Edwards, D. K.	NCA 2-353	2054
46	UNIV CALIF-IRVINE	Owens, F. C.	HQ-XE	Sirignano, W. A.	NGT 00-050-372	2056
46	UNIV CALIF-L ANGELES	Baker, K. W.	LERC	Catton, I.	NAG 3-899	2071
46	UNIV CALIF-SAN DIEGO	Ross, H. D.	LERC	Berlad, A. L.	NAG 3-925	2175
46	UNIV CALIF-S BARBARA	Coe, H. H.	LERC	Vanderplaats, G.	NAG 3-683	2285
46	UNIV CALIF-S BARBARA	Arnold, S. M.	LERC	Leckie, F. A.	NAG 3-894	2286
46	CAMBRIDGE UNIVERSITY	Newman, J. C.	LARC	Fleck, N. A.	NAGW 1014	6492
46	UNIV OF CENTRAL FLA	Owens, F. C.	HQ-XE	Bishop, P.	NGT 00-050-390	2764
46	UNIV OF CINCINNATI	Ross, H. D.	LERC	Disimile, P. J.	NAG 3-938	5119
46	UNIV OF CINCINNATI	Oswald, F. B.	LERC	Huston, R. L.	NSG 3188	5137
46	UNIV OF CINCINNATI	Owens, F. C.	HQ-XE	Huston, R. L.	NGT 00-070-049	5134
46	UNIV COLORADO-BOLDR	Giles, G. L.	LARC	Park, K. C.	NAG 1-756	2405
46	UNIV COLORADO-BOLDR	Owens, F. C.	HQ-XE	Park, K. C.	NGT 00-050-254	2547
46	UNIV OF CONNECTICUT	Fralick, G. C.	LERC	Jordon, E. H.	NAG 3-854	2588
46	UNIV OF CONNECTICUT	Fralick, G. C.	LERC	Jordan, E. H.	NAG 3-1004	2590
46	UNIV OF FLORIDA	Nimmo, N. A.	LARC	Zimmerman, D. C.	NAG 1-1017	2773
46	UNIV OF FLORIDA	Schock, H. J.	LERC	Shih, T. I.	NAG 3-363	2775
46	UNIV OF FLORIDA	Nguyen, H. L.	LERC	P-shih, T. I.	NAG 3-911	2778
46	UNIV HOUSTON-HOUSTON	Ferris, E. P.	JSC	Bannerot, R. B.	NAG 9-197	5717
46	UNIV HOUSTON-HOUSTON	Owens, F. C.	HQ-XE	Powell, A.	NGT 00-050-415	5749
46	UNIV HOUSTON-HOUSTON	Owens, F. C.	HQ-XE	Lienhard, J. H.	NGT 00-070-103	5750
46	UNIV HOUSTON-HOUSTON	Owens, F. C.	HQ-LE	Allen, R. H.	NGT 00-050-069	5744
46	UNIV HOUSTON-HOUSTON	Owens, F. C.	HQ-LE	Hussain, A. K.	NGT 00-050-097	5745
46	UNIV HOUSTON-HOUSTON	Owens, F. C.	HQ-LE	Koopmann, G. H.	NGT 00-050-121	5746
46	UNIV HOUSTON-HOUSTON	Owens, F. C.	HQ-LE	Hussain, A. F.	NGT 44-005-808	5752
46	UNIV HOUSTON-HOUSTON	Owens, F. C.	HQ-LE	Hussain, A. K.	NGT 44-005-809	5753
46	UNIV ILLINOIS-CHICGO	Hands Schuh, R. F.	LERC	Litvin, F. L.	NAG 3-655	3097
46	UNIV ILLINOIS-CHICGO	Hands Schuh, R. F.	LERC	Litvin, F. L.	NAG 3-783	3099
46	UNIV ILLINOIS-CHICGO	Bulzan, D. L.	LERC	Aggarwal, S. K.	NAG 3-796	3100
46	UNIV ILLINOIS-URBANA	Owens, F. C.	HQ-XE	Bentsman, J.	NGT 00-050-356	3156
46	UNIV ILLINOIS-URBANA	Owens, F. C.	HQ-XE	Dutton, J. C.	NGT 00-050-384	3158
46	UNIV OF KANSAS	Mixon, R. W.	LARC	Barr, B. G.	NAG 1-912	3355
46	UNIV OF KANSAS	Owens, F. C.	HQ-XE	Barr, B. G.	NGT 00-050-113	3374
46	UNIV OF KENTUCKY	Oswald, F. B.	LERC	Seybert, A. F.	NAG 3-912	3386
46	UNIV MARYLAND-COL PK	Rodriguez, G. E.	GSFC	Kirk, J. A.	NAG 5-396	3525
46	UNIV MICH-ANN ARBOR	Miura, H.	ARC	Kikuchi, N.	NCA 2-136	4065
46	UNIV MICH-ANN ARBOR	McQuillen, J.	LERC	Merte, H.	NAG 3-589	3990
46	UNIV MICH-ANN ARBOR	Chiaromonte, F. P.	LERC	Merte, H., Jr.	NAG 3-663	3993
46	U MINN-MNPLS-ST PAUL	Scotti, S.	LARC	Tamma, K. K.	NAG 1-808	4099
46	U MINN-MNPLS-ST PAUL	O'brien, J. E.	LERC	Simon, T. W.	NAG 3-881	4103
46	UNIV OF NEW MEXICO	Juhasz, A. J.	LERC	Elgenk, M.	NAG 3-941	4411
46	UNIV N CAR-CHARLOTTE	Vranish, J. M.	GSFC	De Hoff, P. H.	NAG 5-922	4832
46	UNIV N CAR-CHARLOTTE	Vranish, J. M.	GSFC	Dehoff, P. H.	NAG 5-1169	4834
46	UNIV N CAR-CHARLOTTE	Howard, F. S.	KSC	Wang, P. L.	NAG10-57	4835
46	UNIV N CAR-CHARLOTTE	Owens, F. C.	HQ-XE	Daneshvar, K.	NGT 00-050-253	4836
46	UNIV OKLAHOMA-NORMAN	Fernandez, K. R.	MSFC	Pulat, P. S.	NAG 8-137	5186
46	UNIV OKLAHOMA-NORMAN	Owens, F. C.	HQ-XE	Kline, R. A.	NGT 00-050-412	5188
46	UNIV OF PACIFIC	Steinle, F. W., Jr.	ARC	Pejack, E. R.	NAG 2-505	2332
46	UNIV OF PACIFIC	Steinle, F. W.	ARC	O'dell, J.	NAG 2-563	2333
46	UNIV SO CAROLINA-COL	Darcy, E. C.	JSC	Morehouse, J. H.	NAG 9-187	5479
46	UNIV SO CAROLINA-COL	Wagner, H. A.	JSC	Morehouse, J. H.	NAG 9-311	5480
46	UNIV OF SO FLORIDA	Dustin, M. O.	LERC	Crane, R. A.	NAG 3-851	2824
46	UNIV OF SOUTHERN CAL	Owens, F. C.	HQ-XE	Arbib, M.	NGT 00-050-163	2374

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46	UNIV TENNESSEE-KNOXV	Hankins, W. W.	LARC	Dubey, R. V.	NAG 1-1008	5507
46	UNIV TENNESSEE-KNOXV	Eskridge, R. H.	MSFC	Jeng, S. M.	NAG 8-132	5511
46	UNIV TENNESSEE-KNOXV	Owens, F. C.	HQ-XE	Jeng, S. M.	NGT 00-050-360	5526
46	UNIV TEXAS-AUSTIN	Martin, E. D.	ARC	Panton, R. L.	NCA 2-179	5828
46	UNIV TEXAS-AUSTIN	Tassel, K. V.	JSC	Varghese, P. L.	NAG 9-201	5797
46	UNIV TEXAS-AUSTIN	Heydorn, R. P.	JSC	Bard, J. F.	NAG 9-278	5799
46	UNIV TEXAS-AUSTIN	Van Tassel, K. E.	JSC	Varghese, P. L.	NAG 9-301	5803
46	UNIV TEXAS-AUSTIN	Hamilton, D. A.	JSC	Craig, R. R.	NAG 9-346	5805
46	UNIV TEXAS-AUSTIN	Adams, J. C.	JSC	Tesar, D. E.	NAG 9-360	5808
46	UNIV TEXAS-AUSTIN	Owens, F. C.	HQ-XE	Koen, B. V.	NGT 00-050-223	5840
46	UNIV TEXAS-EL PASO	Holder, B. W.	JSC	Craver, W. L., Jr.	NAG 9-146	5881
46	UNIV TEXAS-EL PASO	Rocha, A. R.	JSC	Craver, W. L.	NAG 9-382	5884
46	UNIV TEXAS-EL PASO	Owens, F. C.	HQ-XE	Craver, W. L.	NGT 00-070-112	5889
46	UNIV OF TOLEDO	Curran, F. M.	LERC	Keith, T. G., Jr.	NAG 3-713	5148
46	UNIV OF TOLEDO	Curran, F.	LERC	Keith, T. G.	NAG 3-757	5150
46	UNIV OF UTAH	Hinkley, J. A.	LERC	Bascom, W. D.	NAS 1-18883	5937
46	UNIV OF VIRGINIA	Fleming, D. P.	LERC	Allaire, P. E.	NAG 3-909	6111
46	UNIV OF VIRGINIA	Owens, F. C.	HQ-XE	Pilkey, W. D.	NGT 00-050-343	6147
46	UNIV OF VIRGINIA	Owens, F. C.	HQ-LE	Pilkey, W.	NGT 00-050-116	6142
46	UNIV OF WALES	Starnes, J. H.	LARC	Williams, F. W.	NCCW 2	6495
46	UNIV OF WASHINGTON	Shore, C. P.	LARC	Emery, A. F.	NAG 1-41	6250
46	UNIV OF WASHINGTON	Johnson, W. S.	LARC	Tuttle, M. E.	NAG 1-974	6256
46	UNIV WISC-MADISON	Kittel, P.	ARC	Vansciver, S. W.	NAG 2-358	6375
46	UNIV WISC-MADISON	Brown, G. V.	LERC	Boom, R. W.	NAG 3-1041	6382
46	UNIV WISC-MADISON	Owens, F. C.	HQ-XE	Norman, J. M.	NGT 00-070-119	6454
46	UNIV WISC-MILWAUKEE	Schafer, C. F.	MSFC	Amano, R.	NAG 8-617	6456
46	UTAH STATE UNIV	Nelson, P. J.	MSFC	Phillips, W. F.	NAS 8-37754	5954
46	VANDERBILT UNIVERSTY	Owens, F. C.	HQ-XE	Pitz, R. W.	NGT 00-050-143	5543
46	VANDERBILT UNIVERSTY	Owens, F. C.	HQ-XE	Pitz, R. W.	NGT 00-050-263	5544
46	COLLEGE OF WM & MARY	Tanner, J. A.	LARC	Anderson, C. M.	NCC 1-40	5983
46	VIRGINIA POLY INST	Gelhausen, P. A.	ARC	Mahan, J. R.	NCC 2-568	6228
46	VIRGINIA POLY INST	Horner, G. C.	LARC	Robertshaw, H. H.	NAG 1-570	6172
46	VIRGINIA POLY INST	Horner, G. C.	LARC	Robertshaw, H. H.	NAG 1-933	6191
46	VIRGINIA POLY INST	Owens, F. C.	HQ-XE	Telionis, D. P.	NGT 00-050-144	6234
46	VIRGINIA POLY INST	Owens, F. C.	HQ-XE	Robertshaw, H. H.	NGT 00-050-392	6236
46	VIRGINIA POLY INST	Owens, F. C.	HQ-XE	Reddy, J. N.	NGT 00-050-404	6238
46	VIRGINIA POLY INST	Owens, F. C.	HQ-XE	Ng, W. F.	NGT 00-050-439	6240
46	VIRGINIA POLY INST	Owens, F. C.	HQ-XE	Mahan, J. R.	NGT 00-070-088	6242
46	VIRGINIA POLY INST	Owens, F. C.	HQ-LE	O'brien, W. F.	NGT 00-050-001	6229
46	VIRGINIA POLY INST	Owens, F. C.	HQ-LE	Ng, W. F.	NGT 00-050-089	6231
46	VIRGINIA POLY INST	Owens, F. C.	HQ-LE	Telionis, D. P.	NGT 00-050-123	6233
46	WASHINGTON ST UNIV	Owens, F. C.	HQ-XE	Chung, J. N.	NGT 00-050-481	6351
46	WASHINGTON UNIVERSTY	Chato, D. J.	LERC	Hochstein, J. I.	NAG 3-578	4187
46	WASHINGTON UNIVERSTY	Miller, D. R.	LERC	Hochstein, J. I.	NAG 3-817	4188
46	WASHINGTON UNIVERSTY	Hardy, T. L.	LERC	Hochstein, J. I.	NAG 3-905	4189
46	WASHINGTON UNIVERSTY	Owens, F. C.	HQ-XE	Szabo, B. A.	NGT 00-050-138	4216
46	WAYNE STATE UNIV	Chaiko, L. I.	LERC	Rivin, E. I.	NAG 3-918	4095
46	WEST VIRGINIA UNIV	Owens, F. C.	HQ-XE	Dwivedi, S. N.	NGT 00-070-144	6361
46	WESTERN MICHIGAN U	Bogue, R. K.	ARC	Hoadley, A. W.	NCC 2-493	4097
46	WORCESTER POLY INST	Owens, F. C.	HQ-XE	Durgin, W.	NGT 00-050-428	3956
46	WRIGHT STATE UNIV	Swanson, T. D.	GSFC	Faghri, A.	NAG 5-956	5173
46	YALE UNIVERSITY	Arnold, S. M.	LERC	Onat, E. T.	NAG 3-834	2595
47	ALFRED UNIVERSITY	Shaw, N. J.	LARC	Laughner, J. W.	NCC 3-59	4427
47	ARIZONA STATE UNIV	Alexander, J. K.	HQ-E	Raupp, G. B.	NAGW 1654	1266
47	AUBURN UNIV-AUBURN	Taylor, R. A.	MSFC	Askew, R. F.	NAG 8-719	1031
47	AUBURN UNIV-AUBURN	Owens, F. C.	HQ-LE	Jang, B.	NGT 00-050-084	1047
47	BROWN UNIVERSITY	Browne, I. D.	JSC	Hess, P. C.	NAG 9-109	5422
47	CALIF INST OF TECH	Browne, I. D.	JSC	Burnett, D. S.	NAG 9-94	1525
47	CALIF INST OF TECH	Crews Jr., J. H.	LARC	Knauss, W. G.	NAG 1-474	1494
47	CARNEGIE-MELLON UNIV	Dreshfield, R. L.	LERC	Bernstein, I. M.	NAG 3-463	5227

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47	CARNEGIE-MELLON UNIV	Ngwyen, H. L.	LERC	Shih, T. I.	NAG 3-997	5231
47	CASE WESTERN RESERVE	Nathal, M. V.	LERC	Vedula, K. M.	NAG 3-387	4849
47	CASE WESTERN RESERVE	Halford, G. R.	LERC	Manson, S. S.	NAG 3-553	4853
47	CASE WESTERN RESERVE	Powell, J. A.	LERC	Pirouz, P.	NAG 3-758	4867
47	CASE WESTERN RESERVE	Hurwitz, F. I.	LERC	Ishida, H.	NAG 3-769	4869
47	CASE WESTERN RESERVE	Freedman, M. R.	LERC	Feke, D. L.	NAG 3-785	4870
47	CASE WESTERN RESERVE	Gross, B.	LERC	Ballarini, R.	NAG 3-856	4880
47	CASE WESTERN RESERVE	Chait, A.	LERC	Claspy, P. C.	NAG 3-878	4881
47	CASE WESTERN RESERVE	Halford, G. R.	LERC	Manson, S. S.	NAG 3-939	4887
47	CASE WESTERN RESERVE	Glasgow, T. K.	LERC	Laxmanan, V.	NCC 3-74	4906
47	CASE WESTERN RESERVE	Jaskowiak, M. H.	LERC	Cooper, A. R.	NCC 3-82	4908
47	CASE WESTERN RESERVE	Gray, H. R.	LERC	Michal, G. M.	NCC 3-94	4911
47	CASE WESTERN RESERVE	Glasgow, T. K.	LERC	Qutubuddin, S.	NCC 3-108	4915
47	CASE WESTERN RESERVE	Glasgow, T. K.	LERC	Edwards, R. V.	NCC 3-115	4917
47	CASE WESTERN RESERVE	Levine, S. R.	LERC	Deguire, M. R.	NCC 3-129	4921
47	CASE WESTERN RESERVE	Jaskowiak, M. H.	LERC	Bansal, N. P.	NCC 3-133	4923
47	CASE WESTERN RESERVE	Freedman, M. R.	LERC	Feke, D. L.	NCC 3-134	4924
47	CASE WESTERN RESERVE	Levine, S. R.	LERC	Williams, W. S.	NCC 3-139	4926
47	CASE WESTERN RESERVE	Gray, H. R.	LERC	Michal, G. M.	NCC 3-144	4929
47	CASE WESTERN RESERVE	Rosenthal, B. N.	LERC	Claspy, P. C.	NCC 3-147	4930
47	CASE WESTERN RESERVE	Owens, F. C.	HQ-LE	Michal, G. M.	NGT 00-050-087	4931
47	CHRISTPHR NEWPRT COL	Winfree, W. P.	LARC	Caton, R.	NAG 1-1042	5968
47	CLARKSON UNIVERSITY	Fripp, A. L.	LARC	Carlson, F. M.	NAG 1-397	4441
47	CLEMSON UNIV-CLEMSON	Brewer, W. D.	LARC	Rack, H. J.	NAG 1-724	5453
47	CLEMSON UNIV-CLEMSON	Buckley, J. D.	LARC	Haertling, G. H.	NAG 1-820	5455
47	CLEMSON UNIV-CLEMSON	Farley, G. L.	LARC	Kennedy, J. M.	NCC 1-93	5466
47	CLEMSON UNIV-CLEMSON	Farley, G. L.	LARC	Kennedy, J. M.	NCC 1-127	5467
47	CLEMSON UNIV-CLEMSON	Farley, G. L.	LARC	Huey, C.	NCC 1-128	5468
47	CLEMSON UNIV-CLEMSON	Maahs, H. G.	LARC	Edie, D. D.	NCC 1-134	5469
47	CLEVELAND STATE UNIV	Hurwitz, F. I.	LERC	Hemann, J. H.	NAG 3-749	4949
47	CLEVELAND STATE UNIV	Klima, S. J.	LERC	Hemann, J. H.	NCC 3-24	4963
47	CLEVELAND STATE UNIV	Miller, R. A.	LERC	Ponter, A.	NCC 3-27	4964
47	CLEVELAND STATE UNIV	Calomino, A. M.	LERC	Ghosn, L.	NCC 3-46	4966
47	CLEVELAND STATE UNIV	Glasgow, T. K.	LERC	Kramerich, G. L.	NCC 3-61	4970
47	CLEVELAND STATE UNIV	Wittenberger, J. D.	LERC	Tewari, S. N.	NCC 3-72	4974
47	CLEVELAND STATE UNIV	Savino, J. M.	LERC	Pintz, A.	NCC 3-77	4975
47	CLEVELAND STATE UNIV	Gyekenyesi, J. P.	LERC	Hemann, J. H.	NCC 3-81	4976
47	CLEVELAND STATE UNIV	Gray, H. R.	LERC	Tewari, S. N.	NCC 3-95	4978
47	CLEVELAND STATE UNIV	Glasgow, T. K.	LERC	Tewari, S. N.	NCC 3-96	4979
47	CLEVELAND STATE UNIV	Titran, R. H.	LERC	Tewari, S. N.	NCC 3-119	4983
47	CLEVELAND STATE UNIV	Levine, S. R.	LERC	Hemann, J. H.	NCC 3-138	4986
47	CLEVELAND STATE UNIV	Glasgow, T. K.	LERC	Tewari, S. N.	NCC 3-142	4987
47	CLEVELAND STATE UNIV	Lee, J. E.	MSFC	Tewari, S. N.	NAG 8-91	4959
47	COLORADO STATE UNIV	Williams, J. P.	LARC	Brubaker, T. P.	NAG 1-909	2380
47	COLUMBIA UNIVERSITY	Petrasek, D. W.	LERC	Tien, J. K.	NAG 3-720	4457
47	COLUMBIA UNIVERSITY	Grobstein, T. L.	LERC	Tien, J. K.	NAG 3-936	4459
47	DARTMOUTH COLLEGE	Nathal, M. V.	LERC	Baker, I.	NAG 3-775	4262
47	DREXEL UNIVERSITY	Dexter, H. B.	LARC	Pastore, C. M.	NCC 1-138	5254
47	GEORGE WASHINGTON U	Mixson, J. S.	LARC	Liebowitz, H.	NAG 1-158	2655
47	GEORGE WASHINGTON U	Westfall, L. J.	LERC	Hobbs, H. H.	NAG 3-642	2661
47	GEORGIA INST OF TECH	O'brien, T. K.	LARC	Rehfield, L. W.	NAG 1-637	2844
47	GEORGIA INST OF TECH	Verrilli, M. J.	LERC	Antolovich, S. D.	NAG 3-503	2861
47	GEORGIA INST OF TECH	Gray, H. R.	LERC	Antolovich, S. D.	NCC 3-116	2894
47	GEORGIA INST OF TECH	Harwell, R. J.	MSFC	Tucker, D. S.	NAG 8-103	2873
47	INDIANA ST UNIV	Bowles, K. J.	LERC	Ahn, M. K.	NAG 3-952	3170
47	ILL INST OF TECH	Gray, H. R.	LERC	Nash, P.	NCC 3-101	2989
47	IOWA STATE UNIV	Browne, I. D.	JSC	Kracher, A.	NAG 9-112	3276
47	JOHNS HOPKINS UNIV	Vary, A.	LERC	Green, R. F., Jr.	NAG 3-728	3447
47	LEHIGH UNIVERSITY	Browne, I. D.	JSC	Goldstein, J. I.	NAG 9-45	5264
47	LEHIGH UNIVERSITY	Owens, F. C.	HQ-XE	Wood, J. D.	NGT 00-050-417	5268

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47	LONGWOOD COLLEGE	Fripp, A. L.	LARC	Barber, P. G.	NAG 1-627	6021
47	MASS INST OF TECH	Browne, I. D.	JSC	Prinn, R. G.	NAG 9-108	3786
47	MASS INST OF TECH	Kautz, H. E.	LERC	Williams Jr., J. H.	NAG 3-328	3733
47	MASS INST OF TECH	Harf, F. H.	LERC	Cornie, J. A.	NAG 3-808	3742
47	MASS INST OF TECH	Bhatt, R. T.	LERC	Haggerty, J. S.	NAG 3-845	3745
47	MASS INST OF TECH	Harf, F. H.	LERC	Flemings, M. C.	NAS 3-24875	3831
47	MASS INST OF TECH	Harf, F. H.	LERC	Szekely, J.	NAS 3-25074	3832
47	MASS INST OF TECH	Currevi, P. A.	MSFC	Russell, K. C.	NAG 8-84	3776
47	MASS INST OF TECH	Crouch, R.	HQ-EN	Witt, A. F.	NSG 7645	3888
47	MICHIGAN TECH UNIV	De Grah, H.	LERC	Hellawell, A.	NAG 3-560	3971
47	MICHIGAN TECH UNIV	Owens, F. C.	HQ-XE	Hellawell, A.	NGT 00-070-154	3974
47	MISSISSIPPI STATE U	Fikes, L. A.	MSFC	Hall, W. B.	NAG 8-545	4152
47	NORFOLK STATE UNIV	Massenberg, S. E.	LARC	Jacobs, J. A.	NAG 1-976	6025
47	NO CAROLINA STATE U	Wakelyn, N. T.	LARC	Theil, M. H.	NAG 1-723	4786
47	NO CAROLINA STATE U	Ethridge, E.	MSFC	Koch, C. C.	NAG 8-475	4799
47	NORTHWESTERN UNIV	Barrett, D.	LARC	Unavailable	NAS 1-18877	3010
47	NORTHWESTERN UNIV	Englund, D. R.	LERC	Brittain, J. O.	NAG 3-501	2993
47	NORTHWESTERN UNIV	Chait, A.	LERC	Davis, S. H.	NAG 3-747	2994
47	NORTHWESTERN UNIV	Frazier, D. A.	MSFC	Voorhees, P. W.	NAG 8-769	3007
47	NORTHWESTERN UNIV	Thom, R. L.	MSFC	Sproul, W. D.	NAS 8-37686	3011
47	OHIO STATE UNIV	Sanders, W. A.	LERC	Drummond, C. H.	NAG 3-824	5023
47	OHIO STATE UNIV	Schwartz, H. J.	LERC	Altan, T.	NAG 3-930	5027
47	OHIO STATE UNIV	Draper, S. L.	LERC	Lee, W. E.	NAG 3-942	5028
47	OHIO STATE UNIV	Yates, I. C.	MSFC	Stroud, D. G.	NAG 8-483	5040
47	OLD DOMINION UNIV	Outlaw, R. A.	LARC	Khandelwal, G. S.	NAG 1-1020	6062
47	PENN STATE U-UNIV PK	Nathal, M. V.	LERC	Koss, D. A.	NAG 3-827	5298
47	PENN STATE U-UNIV PK	Kublin, T. V.	MSFC	Salamon, N. J.	NAG 8-775	5326
47	PENN STATE U-UNIV PK	Quigley, B. F.	HQ-RM	Tressler, R. E.	NAGW 1381	5334
47	PRAIRIE VIEW A&M U	Leger, L.	JSC	Wang, F. C.	NAS 9-17406	5572
47	PURDUE UNIVERSITY	Bowles, K. A.	LERC	Caruthers, J. M.	NAG 3-599	3204
47	PURDUE UNIVERSITY	Roberts, G. D.	LERC	Caruthers, J. M.	NCC 3-128	3232
47	RENSSELAER POLY-NY	Johnston, N. J.	LARC	Sternstein, S. S.	NAG 1-253	4622
47	RENSSELAER POLY-NY	Winsa, E. A.	LERC	Glicksman, M. E.	NAG 3-333	4628
47	RENSSELAER POLY-NY	Santoro, G. J.	LERC	German, R. M.	NAG 3-744	4631
47	RENSSELAER POLY-NY	Santoro, G. J.	LERC	German, R. M.	NAG 3-978	4634
47	RENSSELAER POLY-NY	Johnston, J. C.	LERC	Hahn, R. C.	NAG 3-1065	4635
47	RENSSELAER POLY-NY	Winsa, E. A.	LERC	Glicksman, M. E.	NAS 3-25368	4643
47	RENSSELAER POLY-NY	Schaefer, D. A.	MSFC	Wiedemier, H.	NAS 8-32936	4644
47	RICE UNIVERSITY	Parker, R. A.	JSC	Dufour, R. J.	NAG 9-123	5586
47	RICE UNIVERSITY	Horiuchi, G. K.	JSC	Brotzen, F. R.	NAG 9-282	5590
47	RICE UNIVERSITY	Horiuchi, G. K.	JSC	Brotzen, F. R.	NAG 9-359	5594
47	ST MARYS COLLEGE	Matus, L. G.	LERC	Bellina, J. J.	NAG 3-890	3247
47	SAN JOSE STATE UNIV	Riccitiello, S. R.	ARC	Anderson, R. N.	NCC 2-3	1661
47	SAN JOSE STATE UNIV	Riccitiello, S. R.	ARC	Anderson, R. N.	NCC 2-195	1665
47	STANFORD UNIVERSITY	Nelson, H. G.	ARC	Springer, G. S.	NCC 2-304	1805
47	STANFORD UNIVERSITY	Nelson, H. G.	ARC	Nelson, D. V.	NCC 2-510	1817
47	STATE UNIV NY-BUFFAL	Gross, B.	LERC	Wetherhold, R. C.	NAG 3-862	4689
47	STATE U NY-STONY BRK	Glasgow, T. K.	LERC	Dhadwal, H. S.	NAG 3-963	4705
47	TENNESSEE STATE UNIV	Randall, J. L.	MSFC	McCain, W. S.	NAG 8-101	5499
47	TEXAS A&M UNIVERSITY	Castner, W. L.	JSC	Roschke, P. N.	NAG 9-280	5660
47	TEXAS A&M UNIVERSITY	Castner, W. L.	JSC	Stafford, S.	NAG 9-395	5669
47	TEXAS A&M UNIVERSITY	Whitcomb, J. D.	LARC	Bradley, W. L.	NAG 1-659	5628
47	TEXAS A&M UNIVERSITY	Whitcomb, J. D.	LARC	Highsmith, A. L.	NAG 1-711	5629
47	TEXAS A&M UNIVERSITY	Whittenberger, J. D.	LERC	Wolfenden, A.	NAG 3-702	5640
47	TEXAS A&M UNIVERSITY	Alexander, J. K.	HQ-E	Pandey, R. K.	NAGW 1590	5673
47	TEXAS A&M UNIVERSITY	Owens, F. C.	HQ-XE	Schapery, R.	NGT 00-050-261	5688
47	TUFTS UNIVERSITY	Staton, L. D.	LARC	Afsar, M.	NAG 1-930	3896
47	TULANE UNIVERSITY	Gross, B.	LERC	Rubenstein, A. A.	NAG 3-967	3423
47	TUSKEGEE UNIVERSITY	Johnson, W. S.	LARC	Jeelani, S.	NAG 1-742	1059
47	TUSKEGEE UNIVERSITY	Randall, J.	MSFC	Jeelani, S.	NAG 8-44	1063

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47	TUSKEGEE UNIVERSITY	Randall, J. L.	MSFC	Jeglani, S.	NAG 8-131	1066
47	UNIV OF AKRON	Roberts, G. P.	LERC	Young, G. W.	NCC 3-104	5103
47	UNIV OF AKRON	Rosenthal, B. N.	LERC	Batur, C.	NCC 3-109	5104
47	UNIV ALA-BIRMINGHAM	Robinson, M. B.	MSFC	Andrews, J. B.	NAG 8-72	1073
47	UNIV ALA-BIRMINGHAM	Curreri, P. A.	MSFC	Andrews, J. B.	NAG 8-640	1074
47	UNIV ALA-BIRMINGHAM	Gamwell, W. R.	MSFC	Thompson, R. G.	NAS 8-38084	1083
47	UNIV ALA-BIRMINGHAM	Owens, F. C.	HQ-LE	Andrews, J.	NGT 00-050-040	1085
47	UNIV ALA-HUNTSVILLE	Bennett, J. E.	JSC	Workman, G. L.	NAS 9-17962	1177
47	UNIV ALA-HUNTSVILLE	Duvall, W.	LERC	Rosenberger, F. E.	NAS 3-25361	1153
47	UNIV ALA-HUNTSVILLE	Leslie, F. W.	MSFC	Hung, R. J.	NAG 8-129	1114
47	UNIV ALA-HUNTSVILLE	Oran, W. A.	HQ-IC	Lundquist, C.	NAGW 812	1141
47	UNIV ALA-UNIVERSITY	Curreri, P. A.	MSFC	Stefanesai, D. M.	NAG 8-70	1193
47	UNIV OF ARIZONA	Goldstein, S. H.	JSC	Ortiz, K.	NAG 9-259	1344
47	UNIV OF ARIZONA	Chait, A.	LERC	Poirier, D. R.	NAG 3-723	1305
47	UNIV CALIF-BERKELEY	Owens, F. C.	HQ-XE	Weber, E. R.	NGT 00-070-074	1997
47	UNIV CALIF-BERKELEY	Owens, F. C.	HQ-LE	Haller, E. F.	NGT 00-050-037	1979
47	UNIV CALIF-L ANGELES	Holanda, R.	LERC	Bunshah, R. F.	NAG 3-451	2070
47	UNIV CALIF-S BARBARA	Nelson, H. G.	ARC	Shanabarger, M. R.	NCC 2-63	2303
47	UNIV OF CINCINNATI	Bhatt, R. T.	LERC	Jayaraman, N.	NAG 3-506	5114
47	UNIV COLORADO-BOLDR	Chait, A.	LERC	Biringer, S.	NAG 3-994	2415
47	UNIV OF DELAWARE	Jegley, D. C.	LARC	Pipes, R. B.	NAS 1-18758	2628
47	UNIV OF FLORIDA	Outlaw, R. A.	LARC	Hoflund, G. B.	NAG 1-671	2767
47	UNIV OF FLORIDA	Poe, C. C.	LARC	Sankar, B. V.	NAG 1-826	2770
47	UNIV HOUSTON-HOUSTON	Curry, D. M.	JSC	Shamsundar, N.	NAG 9-216	5721
47	UNIV ILLINOIS-CHICGO	Gross, B.	LERC	Chudnovsky, A.	NAG 3-1034	3102
47	UNIV ILLINOIS-URBANA	Panontin, T. L.	ARC	Robertson, I. M.	NAG 2-602	3115
47	UNIV ILLINOIS-URBANA	Klima, S. J.	LERC	Dos Reis, H. L.	NAG 3-798	3121
47	UNIV ILLINOIS-URBANA	Chait, A.	LERC	Dantzig, J. A.	NAG 3-947	3123
47	UNIV ILLINOIS-URBANA	Alexander, J. K.	HQ-E	Dantzig, J. A.	NAGW 1683	3137
47	UNIV MICH-ANN ARBOR	Johnston, N. J.	LARC	Yee, A. F.	NAG 1-607	3977
47	UNIV MICH-ANN ARBOR	Kinard, W. H.	LARC	Felbeck, D. K.	NAS 1-17008	4049
47	UNIV MICH-ANN ARBOR	Noebe, R. D.	LERC	Gibala, R.	NCC 3-76	4069
47	U MINN-MNPLS-ST PAUL	Browne, I. D.	JSC	Nier, A. O.	NAG 9-110	4114
47	UNIV OF NOTRE DAME	Matus, L. G.	LERC	Zeller, M. V.	NAG 3-428	3251
47	UNIV TENNESSEE-KNOXV	Nathal, M. V.	LERC	Oliver, B. F.	NAG 3-876	5509
47	UNIV TENNESSEE-KNOXV	Ruff, R.	MSFC	Makay, M. H.	NAS 8-37292	5525
47	UNIV TEXAS-AUSTIN	Christiansen, E. L.	JSC	Yew, C. H.	NAG 9-114	5794
47	UNIV TEXAS-AUSTIN	Horiuchi, G. K.	JSC	Marcus, H. L.	NAG 9-205	5798
47	UNIV TEXAS-AUSTIN	Price, C. R.	JSC	Tesar, D.	NAG 9-320	5804
47	UNIV TEXAS-EL PASO	Castner, W. L.	JSC	Guard, R. W.	NAG 9-281	5882
47	UNIV TEXAS-EL PASO	Nunes, A. C.	MSFC	McClure, J. C.	NAS 8-37425	5885
47	UNIV TEXAS-S ANTONIO	Nelson, H. G.	ARC	Brinson, H. F.	NCC 2-618	5920
47	UNIV OF UTAH	Crews, J. H.	LARC	Bascom, W. D.	NAG 1-705	5922
47	UNIV OF UTAH	Hinkley, J. A.	LARC	Bascom, W. D.	NAG 1-706	5923
47	UNIV OF UTAH	Hinkley, J. A.	LARC	Bascom, W. D.	NAG 1-1049	5927
47	UNIV OF UTAH	Gyekenyesi, J. P.	LERC	Shetty, D. K.	NAG 3-789	5931
47	UNIV OF VIRGINIA	Fripp, A. L.	ARC	Jesser, W. A.	NAG 1-350	6101
47	UNIV OF VIRGINIA	Dicus, D. L.	LARC	Gangloff, R. P.	NAG 1-745	6104
47	UNIV OF VIRGINIA	Owens, F. C.	HQ-XE	Allaire, P. E.	NGT 00-070-147	6153
47	UNIV OF VIRGINIA	Venneri, S. L.	HQ-RM	Wadley, H. N.	NAGW 1692	6132
47	UNIV OF WASHINGTON	Castles, S.	GSFC	Riggle, P.	NAG 5-1038	6271
47	UNIV OF WASHINGTON	Titran, R. H.	LERC	Stoebe, T. G.	NAG 3-871	6259
47	UNIV OF WASHINGTON	Greenfield, M. A.	HQ-RM	Bradt, R. C.	NAGW 199	6284
47	UNIV WISC-MADISON	Lehoczeky, S. L.	MSFC	Kou, S.	NAG 8-705	6404
47	UNIV WISC-MADISON	Robinson, M. B.	MSFC	Perepezko, J. H.	NAG 8-771	6406
47	UNIV OF WYOMING	Kourtides, D. A.	ARC	Zimmerman, R. S.	NAG 2-470	6464
47	UNIV OF WYOMING	Johnston, N. J.	LARC	Zimmerman, R. S.	NAG 1-277	6461
47	VANDERBILT UNIVERSTY	Robinson, M. B.	MSFC	Bayuzick, R. J.	NAG 8-765	5535
47	VANDERBILT UNIVERSTY	Oran, W.	HQ-IC	Bayuzik, K. Y.	NAGW 810	5536
47	VIRGINIA POLY INST	Nelson, H. G.	ARC	Brinson, H. F.	NCC 2-71	6227

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47	VIRGINIA POLY INST	Tenney, D. R.	LARC	Stephenson, F. W.	NAG 1-343	6169
47	VIRGINIA POLY INST	Everett, R. A.	LARC	Dowling, N. E.	NAG 1-822	6182
47	VIRGINIA POLY INST	Farley, G. L.	LARC	Morton, J.	NAG 1-1053	6202
47	VIRGINIA POLY INST	Vary, A.	LERC	Henneke, E. G.	NAG 3-172	6204
47	WORCESTER POLY INST	Atkins, H. L.	MSFC	Tuler, F. R.	NAG 8-619	3953
47	YALE UNIVERSITY	Browne, I. D.	JSC	Longhi, J.	NAG 9-93	2603
47	YALE UNIVERSITY	Roberts, G. D.	LERC	Rosner, D. E.	NAG 3-898	2597
49	ARIZONA STATE UNIV	Chai, A.	LERC	Neitzel, G. P.	NAG 3-568	1232
49	AUBURN UNIV-AUBURN	Rupp, C. C.	MSFC	Green, M. E.	NAG 8-618	1027
49	AUBURN UNIV-AUBURN	Hengel, J. E.	MSFC	Foster, W. A.	NAG 8-683	1030
49	AUBURN UNIV-AUBURN	Dozier, J.	MSFC	Foster, W. A.	NAS 8-36288	1039
49	AUBURN UNIV-AUBURN	Owens, F. C.	HQ-XE	Zee, R.	NGT 00-050-433	1053
49	BOSTON UNIVERSITY	Bekey, I.	HQ-Z	Nagem, R. J.	NASW 4468	3656
49	BOWIE STATE COLLEGE	Jones, G. K.	GSFC	Srivastava, S.	NAG 5-1054	3443
49	CALIF INST OF TECH	McGee, A. S.	HQ-XE	Albee, A. L.	NGT 05-003-790	1582
49	CARNEGIE-MELLON UNIV	Andary, J. F.	GSFC	Khosla, P. K.	NAG 5-1091	5234
49	CARNEGIE-MELLON UNIV	Gross, K. W.	MSFC	Chigier, N.	NAG 8-126	5235
49	CARNEGIE-MELLON UNIV	Montemerlo, M. D.	HQ-RC	Kanade, T.	NAGW 1175	5238
49	CASE WESTERN RESERVE	Hopkins, D. A.	ARC	Davy, D. T.	NAG 3-1027	4891
49	CASE WESTERN RESERVE	Lawrence, R. F.	LERC	Boulding, M. E.	NAG 3-406	4850
49	CASE WESTERN RESERVE	Vernon, R. W.	LERC	Kamotani, Y.	NAG 3-567	4854
49	CASE WESTERN RESERVE	Jacobson, T. P.	LERC	Ostrach, S.	NAG 3-570	4855
49	CASE WESTERN RESERVE	Tew, R. C.	LERC	Dybbs, A.	NAG 3-700	4863
49	CASE WESTERN RESERVE	Jaskowiak, M. H.	LERC	Hrma, P.	NAG 3-740	4866
49	CASE WESTERN RESERVE	Litt, J. S.	LERC	Loparo, U. A.	NAG 3-788	4871
49	CASE WESTERN RESERVE	Seasholtz, R. G.	LERC	Kadambi, J. R.	NAG 3-831	4877
49	CASE WESTERN RESERVE	Salzman, J. A.	LERC	T'ien, J. S.	NAG 3-1046	4892
49	CASE WESTERN RESERVE	Montegani, F. J.	LERC	McKeon, T. J.	NCC 3-42	4902
49	CASE WESTERN RESERVE	Glasgow, T. K.	LERC	Mann, J. A.	NCC 3-131	4922
49	CASE WESTERN RESERVE	McGee, A. S.	HQ-XE	Prahl, J. M.	NGT 36-027-011	4940
49	CATHOLIC UNIVERSITY	Mosier, G. E.	GSFC	Nguyen, C. C.	NAG 5-1124	2644
49	CATHOLIC UNIVERSITY	Westcott, R. D.	GSFC	Arozullah, M.	NAG 5-1285	2646
49	CLEMSON UNIV-CLEMSON	Taylor, A. H.	LARC	Drews, M. J.	NAG 1-914	5456
49	CLEVELAND STATE UNIV	Madzsar, G. C.	LERC	Atherton, W. J.	NAG 3-889	4952
49	CLEVELAND STATE UNIV	Tew, R. C.	LERC	Ibrahim, M. B.	NAG 3-955	4954
49	CLEVELAND STATE UNIV	Tew, R. C.	LERC	Ibrahim, M. B.	NAG 3-971	4955
49	CLEVELAND STATE UNIV	Stevenson, E. F.	LERC	Svestka, J. A.	NAG 3-1067	4958
49	CLEVELAND STATE UNIV	Owens, F. C.	HQ-XE	Ghorashi, B.	NGT 00-070-148	4991
49	COLORADO STATE UNIV	Womack, W.	JSC	Phillips, R. W.	NAS 9-17168	2397
49	CORNELL UNIVERSITY	Owens, F. C.	HQ-XE	Brutsaert, W.	NGT 00-050-335	4584
49	CUYAHOGA COMMUNITY C	Lawrence, R. F.	LERC	Niro, L.	NAG 3-313	4992
49	DARTMOUTH COLLEGE	Owens, F. C.	HQ-XE	Sonnerup, B. O.	NGT 00-050-466	4277
49	FISK UNIVERSITY	Warren, L. S.	HQ-U	Neely, G., Jr.	NGT 43-005-901	5493
49	FLORIDA A&M UNIV	Warren, L.	HQ-U	Humphries, F. S.	NGT 00-090-012	2717
49	FLORIDA A&M UNIV	Freeman, Y. B.	HQ-U	Toliver, W.	NGT 00-090-015	2718
49	GALLAUDET COLLEGE	Margolis, M.	HQ-U	Nissen	NGT 00-090-013	2654
49	GEORGE WASHINGTON U	Poland, W., Jr.	GSFC	Helgert, H. J.	NSG 5109	2684
49	GEORGETOWN UNIV	Owens, F. C.	HQ-LE	Krogh, P. F.	NGT 09-009-800	2686
49	GEORGIA INST OF TECH	Palmer, E. A.	ARC	Mitchell, C. M.	NAG 2-413	2857
49	GEORGIA INST OF TECH	Eggers, D. S.	JSC	Cooke, W. P.	NAS 9-17381	2887
49	GEORGIA INST OF TECH	Potapczuk, M. G.	LERC	Sankar, L. N.	NAG 3-768	2864
49	GEORGIA INST OF TECH	Stearns, C. A.	LERC	Brunasso, T.	NAG 3-972	2866
49	GEORGIA INST OF TECH	Proctor, M. P.	LERC	Salant, R. F.	NAG 3-974	2867
49	HAMPTON UNIVERSITY	McGee, A. S.	HQ-XE	Spencer, J. W.	NGT 47-020-800	6020
49	HOWARD UNIVERSITY	Goodson, A.	GSFC	Gill, T. L.	NAG 5-995	2694
49	HOWARD UNIVERSITY	Young, J. W.	LARC	Bainum, P. M.	NSG 1414	2707
49	HOWARD UNIVERSITY	Margolis, M.	HQ-U	Broome, T. H.	NGT 00-090-021	2704
49	IOWA STATE UNIV	Owens, F. C.	HQ-XE	Pierson, B. L.	NGT 00-050-407	3289
49	LINCOLN UNIV-PA	Menchan, D.	GSFC	Williams, W. W.	NCA 5-98	5271
49	LINCOLN UNIV-PA	Freeman, Y. B.	HQ-U	Williams, W.	NGT 00-090-020	5272

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49	MANHATTAN COLLEGE	Armstrong, E. S.	LERC	Naraghi, M. H.	NAG 3-892	4596
49	MASS INST OF TECH	Lee, A. T.	ARC	Young, L. R.	NAG 2-12	3725
49	MASS INST OF TECH	Meyer, G.	ARC	Athans, M.	NAG 2-297	3727
49	MASS INST OF TECH	Owens, F. C.	HQ-XE	Young, L. R.	NGT 00-050-218	3869
49	MASS INST OF TECH	Owens, F. C.	HQ-LE	Young, L.	NGT 00-050-077	3864
49	MASS INST OF TECH	Mulville, D. R.	HQ-RM	Mar, J. W.	NAGW 1335	3813
49	MIAMI UNIVERSITY	Gahn, R. F.	LERC	Scott, W. E.	NAG 3-1053	4999
49	MICHIGAN TECH UNIV	Reid, M. A.	LERC	Cornilsen, B. C.	NAG 3-519	3970
49	MISSISSIPPI STATE U	Weiluenster, K. J.	LARC	Thompson, J. F.	NAG 1-1061	4146
49	MISSISSIPPI STATE U	Olson, S. L.	LERC	Altenkirch, R. A.	NAS 3-23901	4155
49	MISSISSIPPI STATE U	Mc connaughey, P. K.	MSFC	Thompson, J. F.	NAS 8-36949	4158
49	MOREHOUSE COLLEGE	Peters, B.	LARC	Jackson, W.	NGT 00-090-025	2909
49	MORGAN STATE UNIV	Menchan, D.	GSFC	White, C.	NCA 5-105	3496
49	MORGAN STATE UNIV	Warren, L.	HQ-U	Deloatch, E.	NGT 00-090-005	3497
49	MORGAN STATE UNIV	Freeman, Y. B.	HQ-U	Proctor, N.	NGT 00-090-019	3498
49	NEW MEX ST U-LAS CR	Pincus, B. R.	GSFC	Bawcom, D.	NAS 5-29149	4398
49	NEW YORK UNIVERSITY	Meyer, G.	ARC	Demmel, J. W.	NAG 2-493	4601
49	NO CAR A&T STATE U	Bretoi, R. N.	ARC	Ntuen, C. A.	NCA 2-384	4781
49	NO CAROLINA STATE U	Farmer, F. A.	LARC	McAllister, D. F.	NAG 1-696	4785
49	NO CAROLINA STATE U	Wander, S. M.	HQ-RF	Dejarnette, F. R.	NAGW 1331	4803
49	OHIO STATE UNIV	Norman, S. D.	ARC	Smith, P. J.	NCA 2-288	5052
49	OHIO STATE UNIV	Shafro, M.	ARC	Woods, D. D.	NCA 2-351	5055
49	OHIO STATE UNIV	Sagerser, D. P.	LERC	Lee, J. D.	NAG 3-706	5016
49	OHIO STATE UNIV	Fox, D. S.	LERC	Cawley, J. D.	NAG 3-755	5018
49	OHIO STATE UNIV	Stearns, C. A.	LERC	Peters, L.	NAG 3-784	5021
49	OHIO STATE UNIV	Stearns, C. A.	LERC	Dominek, A. K.	NAG 3-1000	5033
49	OHIO STATE UNIV	Jones, C. S.	MSFC	Richardson, R. W.	NAS 8-35595	5050
49	OLD DOMINION UNIV	Roberts, B. B.	JSC	Ash, R. L.	NAG 9-308	6065
49	OLD DOMINION UNIV	Bush, H. G.	LARC	Razzaq, Z.	NAG 1-336	6027
49	OLD DOMINION UNIV	Groom, N. J.	LARC	Britcher, C. P.	NAG 1-1056	6064
49	OLD DOMINION UNIV	Wieting, A. R.	LARC	Thornton, E. A.	NSG 1321	6096
49	OLD DOMINION UNIV	McGee, A. S.	HQ-XE	Tiwari, S. N.	NGT 47-003-029	6095
49	PENN STATE U-UNIV PK	Sager, J. S.	KSC	Walker, P. N.	NAG10-59	5341
49	PENN STATE U-UNIV PK	Armstrong, E. S.	LERC	Santavicca, D. A.	NAG 3-966	5300
49	PENN STATE U-UNIV PK	Owens, F. C.	HQ-XE	Varadan, V. V.	NGT 00-050-410	5366
49	PENN STATE U-UNIV PK	Vanlandingham, E. E.	HQ-RP	Merkle, C. L.	NAGW 1356	5333
49	PRINCETON UNIVERSITY	Meyer, G.	ARC	Ramage, P.	NAG 2-558	4322
49	PRINCETON UNIVERSITY	Haggard, J.	LERC	Williams, F. A.	NAS 3-24640	4349
49	PURDUE UNIVERSITY	Blech, R. A.	LERC	Ecer, A.	NAG 3-858	3208
49	PURDUE UNIVERSITY	Hicks, Y. R.	LERC	Laurendeau, N. M.	NAG 3-1038	3212
49	PURDUE UNIVERSITY	Waites, H. B.	MSFC	Skelton, R. E.	NAG 8-124	3218
49	RENSSELAER POLY-NY	Truskowski, W.	GSFC	Wozny, M. J.	NAG 5-487	4636
49	RENSSELAER POLY-NY	Lawrence, R. F.	LARC	Burnett, N.	NAG 3-544	4629
49	RENSSELAER POLY-NY	Owens, F. C.	HQ-XE	Myrabo, L. N.	NGT 00-070-104	4651
49	RENSSELAER POLY-NY	Montemerlo, M. D.	HQ-RC	Saridis, G. N.	NAGW 1333	4641
49	SAN JUAN COL NEW MEX	Suess, S. T.	MSFC	Nerney, S. F.	NAG 8-130	4409
49	SOUTHERN METHODIST U	Owens, F. C.	HQ-XE	Dula, J. H.	NGT 00-050-536	5613
49	SPELMAN COLLEGE	Margolis, M.	HQ-U	Hibbard, L.	NGT 00-090-018	2912
49	STANFORD UNIVERSITY	Kwak, D.	ARC	Chang, I. D.	NCA 2-198	1764
49	STANFORD UNIVERSITY	Lee, G. S.	ARC	Banks, P. P.	NCA 2-333	1783
49	STANFORD UNIVERSITY	Vykukal, H. C.	ARC	Leifer, L.	NCC 2-295	1804
49	STANFORD UNIVERSITY	Keith, B. H.	GSFC	Banks, P. M.	NCC 5-30	1830
49	STANFORD UNIVERSITY	Leblanc, G. R.	JSC	Banks, P. M.	NCC 9-15	1831
49	STANFORD UNIVERSITY	Rabinowitz, M.	LERC	Chase, R. A.	NAG 3-914	1708
49	STANFORD UNIVERSITY	McGee, A. S.	HQ-XE	Bershafer, D.	NGT 05-020-412	1858
49	STONEHILL COLLEGE	Lee, A. T.	ARC	Cushing, S.	NAG 2-564	3895
49	TEXAS A&M UNIV SYSTM	Stubbs, R. M.	LERC	Peddacord, K. L.	NAG 3-820	5621
49	TEXAS A&M UNIV SYSTM	Stevenson, S. M.	LERC	Peddacord, K. L.	NAG 3-944	5622
49	TEXAS A&M UNIVERSITY	Henry, M. F.	JSC	Young, T.	NAG 9-192	5654
49	TEXAS A&M UNIVERSITY	Sunkel, J. W.	JSC	Parlos, A. G.	NAG 9-275	5658

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49	TEXAS A&M UNIVERSITY	Stroughal, G.	JSC	Porteiro, J. R.	NAS 9-16443	5679
49	TEXAS A&M UNIVERSITY	Madzsar, G. C.	LERC	Taylor, H. F.	NAG 3-846	5642
49	TEXAS A&M UNIVERSITY	Hagedorn, N. H.	LERC	White, R. E.	NAG 3-1043	5644
49	TEXAS A&M UNIVERSITY	Owens, F. C.	HQ-XE	Peddicord, K. L.	NGT 00-050-388	5692
49	TEXAS A&M UNIVERSITY	Owens, F. C.	HQ-XE	Lessard, C. S.	NGT 00-070-108	5697
49	TEXAS A&M UNIVERSITY	McGee, A. S.	HQ-LB	Jones, W. B.	NGT 44-001-800	5699
49	TUSKEGEE UNIVERSITY	Tillman, F.	JPL	Eke, F.	NAGW 1599	1067
49	TUSKEGEE UNIVERSITY	Hardy, T. L.	LERC	Ray, P. R.	NAG 3-726	1060
49	UNIV OF AKRON	Baucom, R. M.	LARC	Kelley, F. N.	NAG 1-779	5079
49	UNIV OF AKRON	Stone, J. R.	LERC	Serafini, J. S.	NAG 3-637	5086
49	UNIV OF AKRON	Proctor, M. P.	LERC	Braun, M. J.	NAG 3-675	5088
49	UNIV ALA-BIRMINGHAM	Snyder, R.	MSFC	Rosenblum, W. E.	NAG 8-743	1076
49	UNIV ALA-HUNTSVILLE	Lindberg, J. P.	ARC	Ford, D.	NAG 8-717	1131
49	UNIV ALA-HUNTSVILLE	Bachtel, F. D.	MSFC	Chen, C. P.	NAG 8-92	1104
49	UNIV ALA-HUNTSVILLE	Gross, K. W.	MSFC	Chen, C. P.	NAG 8-128	1113
49	UNIV ALA-HUNTSVILLE	Richards, J. S.	MSFC	Gilbert, J. A.	NAG 8-686	1124
49	UNIV ALA-HUNTSVILLE	Hale, J. P.	MSFC	Rogers, J. G.	NAG 8-706	1128
49	UNIV ALA-HUNTSVILLE	Morroni, C. A.	MSFC	Alexander, J. I.	NAG 8-724	1133
49	UNIV ALA-HUNTSVILLE	Curreri, P. A.	MSFC	Wu, M. K.	NCC 8-2	1179
49	UNIV ALA-HUNTSVILLE	Wolfsberger, J. W.	MSFC	Ford, D. R.	NCC 8-13	1181
49	UNIV ALA-HUNTSVILLE	Rosendhal, J. D.	HQ-E	Wessling, F. C.	NAGW 847	1142
49	UNIV ALA-HUNTSVILLE	Owens, F. C.	HQ-XE	Chen, C. P.	NGT 00-050-432	1189
49	UNIV ALA-HUNTSVILLE	McGee, A. S.	HQ-XE	Karr, G. R.	NGT 01-008-021	1190
49	UNIV ALA-UNIVERSITY	Curreri, T. A.	MSFC	Stefanescu, D. M.	NCC 8-3	1199
49	UNIV ALA-UNIVERSITY	Owens, F. C.	HQ-LE	Freeman, L. M.	NGT 01-002-099	1200
49	UNIV OF ARIZONA	Sharp, G. R.	LERC	Somner, R. E.	NAS 3-25522	1419
49	UNIV OF ARIZONA	Quaide, W. L.	HQ-EL	Hunten, D. M.	NAGW 546	1351
49	UNIV OF ARIZONA	Quigley, B. F.	HQ-RM	Lewis, J. S.	NAGW 1332	1393
49	UNIV CALIF-BERKELEY	Meyer, G.	ARC	Sastry, S. S.	NAG 2-243	1863
49	UNIV CALIF-BERKELEY	Stocker, D. P.	LERC	Pagni, P. J.	NAG 3-443	1872
49	UNIV CALIF-DAVIS	Lopez, O. F.	LARC	Rehfield, L. W.	NAS 1-18754	2017
49	UNIV CALIF-IRVINE	Ross, H. D.	LERC	Sirignano, W. A.	NAG 3-627	2046
49	UNIV CALIF-L ANGELES	Iliff, K. W.	ARC	Balakrishnan, A. V.	NCC 2-374	2144
49	UNIV CALIF-L ANGELES	Sobieski, J.	LARC	Schmit, L. A., Jr.	NSG 1490	2158
49	UNIV CALIF-SAN DIEGO	Sacksteder, K. R.	LERC	Berlad, A. L.	NAS 3-24639	2230
49	UNIV OF CENTRAL FLA	McGee, A. S.	HQ-XE	Hosler, E. R.	NGT 00-060-002	2765
49	UNIV OF CHICAGO	Horz, F.	JSC	Simpson, J. A.	NAG 9-309	3041
49	UNIV OF CHICAGO	Owens, F. C.	HQ-XE	Muller, D.	NGT 00-050-463	3087
49	UNIV OF CINCINNATI	Owens, F. C.	HQ-XE	Ghia, K. N.	NGT 00-050-416	5130
49	UNIV OF CINCINNATI	Owens, F. C.	HQ-XE	Huston, R. L.	NGT 00-070-048	5133
49	UNIV OF CINCINNATI	Hartman, S. C.	HQ-RS	Gales, L. M.	NAGW 1407	5124
49	UNIV COLORADO-BOLDR	Armstrong, E. S.	LARC	Park, K. C.	NAG 1-1021	2410
49	UNIV COLORADO-BOLDR	Hirschbein, M. S.	HQ-RM	Morganthaler, G. W.	NAGW 1388	2498
49	UNIV OF HAWAII-MANOA	Morakis, J. C.	GSFC	Lin, S.	NAG 5-931	2928
49	UNIV HOUSTON-HOUSTON	Eggers, D. S.	JSC	Long, S. A.	NAG 9-219	5723
49	UNIV HOUSTON-HOUSTON	McGee, A. S.	HQ-XE	Bannerot, R. B.	NGT 44-005-803	5751
49	UNIV OF IDAHO	Miller, W. H.	GSFC	Maki, G. K.	NAG 5-1043	2983
49	UNIV OF IDAHO	Smith, P. H.	HQ-RC	Maki, G. K.	NAGW 1406	2984
49	UNIV ILLINOIS-CHICGO	Meyer, G.	ARC	Grossman, R.	NAG 2-513	3095
49	UNIV ILLINOIS-CHICGO	Shannon, J. L.	LERC	Chudnovsky, A.	NAG 3-754	3098
49	UNIV ILLINOIS-CHICGO	Gross, K. W.	MSFC	Chire, H. H.	NAG 8-106	3103
49	UNIV ILLINOIS-URBANA	Palmer, E. A.	ARC	Sanderson, P. M.	NCC 2-631	3151
49	UNIV ILLINOIS-URBANA	Greene, W. H.	LARC	Lopez, L. A.	NAG 1-646	3107
49	UNIV OF IOWA	Owens, F. C.	HQ-XE	Arora, J.	NGT 00-050-362	3344
49	UNIV OF KANSAS	Samos, J.	LARC	Barr, B. G.	NAG 1-761	3352
49	UNIV MARYLAND-COL PK	Morakis, J. C.	GSFC	Narayan, P.	NAG 5-923	3543
49	UNIV MARYLAND-COL PK	Ford, F. E.	GSFC	Anand, D. K.	NAG 5-955	3547
49	UNIV MARYLAND-COL PK	Figuerola, O.	GSFC	Khan, H. J.	NAG 5-1121	3558
49	UNIV MARYLAND-COL PK	Owens, F. C.	HQ-XE	Baras, J. S.	NGT 00-050-424	3627
49	UNIV MARYLAND-COL PK	McGee, A. S.	HQ-XE	Boroson, H. R.	NGT 21-002-254	3629

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49	UNIV OF MASS-AMHERST	Owens, F. C.	HQ-XE	Fisher, D. L.	NGT 00-050-397	3924
49	UNIV OF MASS-AMHERST	Owens, F. C.	HQ-XE	Swift, C. T.	NGT 00-070-121	3929
49	UNIV OF MIAMI	Wales, R.	GSFC	Brown, O.	NAS 5-29338	2812
49	UNIV OF MIAMI	Wales, R.	GSFC	Brown, O.	NAS 5-30694	2815
49	UNIV MICH-ANN ARBOR	Malin, J. T.	JSC	Kieras, D.	NAG 9-139	4019
49	UNIV MICH-ANN ARBOR	Aydelott, J. C.	LERC	Kaviany, M.	NAS 3-25366	4052
49	UNIV MICH-ANN ARBOR	Draper, S.	LERC	Ghosh, A. K.	NAS 3-25789	4053
49	UNIV MICH-ANN ARBOR	Bilbro, J. W.	MSFC	Hays, P. B.	NAG 8-741	4018
49	UNIV MICH-ANN ARBOR	Owens, F. C.	HQ-LB	Weintraub, D. J.	NGT 23-005-802	4089
49	UNIV MICH-ANN ARBOR	Hartman, S. C.	HQ-RS	Ulaby, F. T.	NAGW 1334	4033
49	UNIV MICH-ANN ARBOR	Bekey, I.	HQ-Z	Kammash, T.	NASW 4471	4064
49	U MINN-MNPLS-ST PAUL	Tew, R. C.	LERC	Goldberg, L. F.	NAG 3-693	4102
49	U MINN-MNPLS-ST PAUL	Tew, R. C.	LERC	Patankar, S. V.	NAG 3-1024	4104
49	UNIV MISS-UNIVERSITY	Owens, F. C.	HQ-XE	Hackett, R. M.	NGT 00-050-365	4167
49	UNIV MO-COLUMBIA	Farmer, F. H.	LARC	Bao, H. P.	NAG 1-875	4172
49	UNIV OF MONTREAL	Palmer, E. A.	ARC	Robert, J. M.	NAGW 1043	6487
49	UNIV NEBRASKA-LINCLN	Yeh, P. S.	GSFC	Sayood, K.	NAG 5-916	4243
49	UNIV OF NEW MEXICO	Cataldo, R. L.	LERC	El Genk, M. S.	NAG 3-992	4412
49	UNIV OF NEW MEXICO	Acevedo, J. C.	LERC	El Genk, M. S.	NAG 3-1045	4413
49	UNIV OF NEW MEXICO	Gutierrez, O. A.	HQ-U	Lee, M.	NGT 32-004-770	4426
49	UNIV OF NOTRE DAME	Miller, W. H.	GSFC	Costello, D.	NAG 5-557	3253
49	UNIV OKLAHOMA-NORMAN	Chapman, J. J.	LARC	Kahng, S. K.	NAG 1-990	5183
49	UNIV OF PENNSYLVANIA	Premack, T.	GSFC	Bajcsy, R.	NAG 5-1045	5381
49	UNIV OF PITTSBURGH	Mihaloew, J. R.	LERC	Vogt, W. B.	NAG 3-729	5398
49	UNIV OF PITTSBURGH	Brewe, D. E.	LERC	Khonsari, M. M.	NAG 3-973	5401
49	UNIV OF SO FLORIDA	Owens, F. C.	HQ-XE	Hall, L. O.	NGT 00-070-110	2830
49	UNIV STHN COLORADO	Holland, V. B.	ARC	Dunn, W. R.	NCC 2-373	2583
49	UNIV STHN COLORADO	Doty, L. W.	ARC	Dunn, W. R.	NCC 2-609	2584
49	UNIV TENNESSEE-KNOXV	Chai, A.	LERC	Parang, M.	NAS 3-25359	5521
49	UNIV TENNESSEE-KNOXV	Scott, D. R.	MSFC	Green, W. L.	NAG 8-630	5512
49	UNIV TEXAS-AUSTIN	Appler, R.	GSFC	Shelvs, P. J.	NAS 5-29404	5822
49	UNIV TEXAS-AUSTIN	Erickson, J. D.	JSC	Kuipers, B.	NAG 9-200	5796
49	UNIV TEXAS-AUSTIN	Simon, F. F.	LERC	Crawford, M. E.	NAG 3-864	5774
49	UNIV TEXAS-AUSTIN	Schultz, D.	LERC	Nozette, S.	NAG 3-928	5776
49	UNIV TEXAS-AUSTIN	Owens, F. C.	HQ-XE	Bertin, J. J.	NGT 00-070-111	5853
49	UNIV TEXAS-AUSTIN	Owens, F. C.	HQ-LB	Hull, D. G.	NGT 44-012-803	5855
49	UNIV TEXAS-EL PASO	Owens, F. C.	HQ-XE	McClure, J. C.	NGT 00-070-086	5887
49	UNIV TEXAS-EL PASO	Owens, F. C.	HQ-XE	McClure, J. C.	NGT 00-070-087	5888
49	U TEX SW MED CTR-DA	Womack, W.	JSC	Gaffney, F. A.	NAS 9-17167	5904
49	UNIV OF TOLEDO	Kiraly, L. J.	LERC	Standley, H. M.	NAG 3-699	5146
49	UNIV OF TOLEDO	Chai, A. T.	LERC	Dewitt, K. J.	NCC 3-34	5166
49	UNIV OF VIRGINIA	Storaasli, O. O.	LARC	Ortega, J. M.	NAG 1-46	6099
49	UNIV OF VIRGINIA	Wieting, A. R.	LARC	Thornton, E. A.	NAG 1-1013	6108
49	UNIV OF VIRGINIA	Owens, F. C.	HQ-XE	Pilkey, W. D.	NGT 00-070-127	6152
49	UNIV WISC-MADISON	Stocker, D. P.	LERC	Farrell, P. V.	NAG 3-718	6378
49	UTAH STATE UNIV	Bubenheim, D. L.	ARC	Bugbee, B.	NCA 2-365	5955
49	VANDERBILT UNIVERSTY	Wood, G. M.	LARC	Potter, J. L.	NAG 1-878	5530
49	VIRGINIA POLY INST	Somers, D. M.	LARC	Eiss Jr., N. S.	NAG 1-300	6168
49	VIRGINIA POLY INST	Chestnutt, D.	LARC	Fuller, C. R.	NAG 1-762	6179
49	VIRGINIA POLY INST	Sobieski, J.	LARC	Drew, D. R.	NAS 1-17256	6221
49	VIRGINIA POLY INST	Zuzek, J. E.	LERC	Ha, T. T.	NAS 3-24887	6224
49	VIRGINIA POLY INST	Owens, F. C.	HQ-LE	Hyer, M. W.	NGT 00-050-119	6232
49	VIRGINIA POLY INST	Owens, F. C.	HQ-LE	Duke, J. C., Jr.	NGT 47-004-811	6244
49	XAVIER UNIV-LA	Warren, L.	HQ-U	Baker, G. W.	NGT 00-090-004	3431
49	XAVIER UNIV-LA	Warren, L.	HQ-U	Morning, C.	NGT 00-090-011	3432
51	ALABAMA A&M UNIV	MacElroy, R. D.	ARC	Tadros, M.	NCC 2-501	1021
51	ALABAMA A&M UNIV	Nachtwey, D. S.	JSC	Kale, P.	NAG 9-246	1015
51	ALABAMA A&M UNIV	Randall, J. L.	MSFC	Ila, D.	NAG 8-115	1012
51	ALABAMA A&M UNIV	Ruff, R. C.	MSFC	Lal, R. B.	NAS 8-36634	1020
51	ARIZONA STATE UNIV	Rummel, J. D.	HQ-EB	Blankenship, R. E.	NAGW 1395	1263

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51	BAYLOR COL OF MED	Daunton, N. G.	ARC	Igarashi, M.	NAG 2-289	5552
51	BAYLOR COL OF MED	Ross, M. D.	ARC	Fermin, C. D.	NAG 2-342	5553
51	BAYLOR COL OF MED	Mandel, A. D.	ARC	Alfrey, C. P.	NAG 2-500	5554
51	BAYLOR UNIVERSITY	Halstead, T. W.	HQ-EB	Moore, R.	NAGW 734	5546
51	BAYLOR UNIVERSITY	Halstead, T. W.	HQ-EB	Moore, R.	NAGW 1041	5547
51	BOSTON UNIVERSITY	Owens, F. C.	HQ-XE	Grossberg, S.	NGT 00-050-497	3659
51	BOWDOIN COLLEGE	Halstead, T. W.	HQ-EB	Phillips, C. R.	NAGW 1719	3433
51	BRANDEIS UNIVERSITY	Kutyna, F. A.	JSC	Johnson, W. H.	NAG 9-293	3660
51	BROOKLYN COLLEGE	Halstead, T. W.	HQ-EB	Schreibman, M. P.	NAGW 1704	4429
51	CAL STATE U-FRESNO	Averner, M.	HQ-EB	Paris, J. F.	NAGW 1700	1602
51	CAL STATE U-NRTHRDGE	Ross, M. D.	ARC	Oppenheimer, S. B.	NAG 2-499	1611
51	CAL STATE U-NRTHRDGE	Owens, F. C.	HQ-XE	Oppenheimer, S. B.	NGT 00-070-085	1616
51	CLARKSON UNIVERSITY	Oran, W.	HQ-IC	Wilcox, W. R.	NAGW 976	4446
51	COLUMBIA UNIVERSITY	Ross, M. D.	ARC	Wolgemuth, D. I.	NAG 2-385	4455
51	COLUMBIA UNIVERSITY	Holton, E. M.	ARC	Doty, S. B.	NCC 2-325	4497
51	CORNELL UNIVERSITY	Halstead, T. W.	HQ-EB	Leopold, A. C.	NAGW 3	4532
51	CORNELL UNIVERSITY	Owens, F. C.	HQ-XE	Bird, J. M.	NGT 00-050-294	4581
51	EAST CAROLINA UNIV	Winget, C. M.	ARC	Bruschi, C. V.	NAG 2-365	4769
51	E VA MED SC-HMPTN RD	Ballard, R. W.	ARC	Spangenberg, D. B.	NAG 2-343	5993
51	E VA MED SC-HMPTN RD	Winget, C. W.	ARC	Spangenberg, D. B.	NAG 2-508	5994
51	EMORY UNIVERSITY	Schmidt, G. K.	ARC	Popovic, V.	NAS 2-10527	2837
51	FISK UNIVERSITY	MacElroy, R. D.	ARC	Gunasekaran, M.	NCC 2-606	5492
51	FLORIDA A&M UNIV	Arnaud, S. B.	ARC	Soliman, K. F.	NAG 2-411	2711
51	FLORIDA STATE UNIV	Rummel, J. D.	HQ-EB	Friedmann, E. I.	NSG 7337	2758
51	GEORGETOWN UNIV	Fischer, J. R.	GSFC	Earley, J. E.	NAG 5-1066	2685
51	GEORGIA STATE UNIV	Ballard, R. W.	ARC	Rumbaugh, D. M.	NAG 2-438	2906
51	HARVARD UNIVERSITY	Ballard, R. W.	ARC	Vatner, S. F.	NAG 2-451	3667
51	HARVARD UNIVERSITY	Leon, H.	ARC	Moore-edde, M. C.	NAS 2-10547	3695
51	HARVARD UNIVERSITY	MacElroy, R. D.	ARC	Mitchell, R.	NCC 2-628	3699
51	INDIANA ST UNIV	Ross, M. D.	ARC	Cochran, S. L.	NAG 2-498	3169
51	INDIANA U-BLOOMINGTN	Souza, K. A.	ARC	Malacinski, G. M.	NAG 2-323	3171
51	INDIANA U-BLOOMINGTN	Ross, M. D.	ARC	Farley, J.	NAG 2-550	3173
51	INDIANA U-BLOOMINGTN	Halstead, T. W.	HQ-EB	Malacinski, G. M.	NAGW 1548	3181
51	IND U-PURDUE-INDAPLS	Holton, E. M.	ARC	Roberts, W. E.	NCC 2-594	3188
51	JOHNS HOPKINS UNIV	Owens, F. C.	HQ-LE	Moudrianakis, E. N.	NGT 00-050-060	3490
51	KENYON COLLEGE	Halstead, T. W.	HQ-EB	Edwards, K. L.	NAGW 368	4997
51	LEHIGH UNIVERSITY	Bannett, B.	MSFC	Vanderhoff, J. W.	NAS 8-32951	5265
51	MARQUETTE UNIVERSITY	Grindeland, R. E.	ARC	Fitts, R. H.	NAG 2-212	6365
51	MASS INST OF TECH	Cohen, M. M.	ARC	Young, L. R.	NAG 2-445	3729
51	MED COL OF WISC	Winget, C. M.	ARC	Riley, D. A.	NAG 2-552	6367
51	MED COL OF WISC	Ferandin, J. A.	ARC	Riley, D. A.	NAS 2-11305	6368
51	MIAMI UNIVERSITY	Kutyna, F.	JSC	Parker, D. E.	NAS 9-17413	5000
51	MICHIGAN STATE UNIV	Winget, C. M.	ARC	Bandurski, R. S.	NAG 2-362	3958
51	MICHIGAN STATE UNIV	Halstead, T. W.	HQ-EB	Bandurski, R. S.	NAGW 97	3965
51	MONTANA STATE UNIV	Owens, F. C.	HQ-XE	McFeters, G. A.	NGT 00-050-217	4232
51	MT SINAI SCH OF MED	Daunton, N. G.	ARC	Cohen, B.	NAG 2-536	4597
51	NEW YORK MEDICAL COL	Tomko, D. L.	ARC	Pellionisz, A. J.	NCA 2-426	4600
51	NEW YORK UNIVERSITY	MacElroy, R. D.	ARC	Volk, T.	NCC 2-608	4614
51	NEW YORK UNIVERSITY	Owens, F. C.	HQ-XE	Rampino, M. R.	NGT 00-050-470	4615
51	NO CAR A&T STATE U	Schmidt, G. K.	ARC	Ahrens, S. T.	NCA 2-545201	4782
51	NORTHWESTERN UNIV	Tomko, D. L.	ARC	Baker, J. F.	NCA 2-374	3013
51	OHIO STATE UNIV	Halstead, T. W.	HQ-EB	Evans, M. E.	NAGW 297	5041
51	OHIO STATE UNIV	Halstead, T. W.	HQ-EB	Cline, M.	NAGW 625	5042
51	OHIO STATE UNIV	Owens, F. C.	HQ-LE	Evans, M. L.	NGT 36-020-800	5066
51	OREGON STATE UNIV	Halstead, T. W.	HQ-EB	Lomax, T. L.	NAGW 1253	5199
51	OREGON STATE UNIV	Owens, F. C.	HQ-XE	Lomax, T.	NGT 00-050-321	5211
51	PA ST U-HERSHEY MED	Keil, L.	ARC	Severs, W. B.	NCC 2-127	5275
51	PENN STATE U-UNIV PK	Winget, C. M.	ARC	Hymer, W. C.	NCC 2-370	5355
51	PRINCETON UNIVERSITY	Ross, M. D.	ARC	Farley, J.	NAG 2-397	4320
51	PURDUE UNIVERSITY	Owens, F. C.	HQ-XE	Kim, K.	NGT 00-050-196	3239

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51	ST LOUIS UNIVERSITY	Holton, E. M.	ARC	Partridge, N. C.	NAG 2-454	4171
51	SAN DIEGO STATE UNIV	Halstead, T. W.	HQ-EB	Rayle, D.	NAGW 230	1629
51	SAN JOSE STATE UNIV	Grindeland, R. E.	ARC	Yengoyan, L. S.	NAG 2-410	1643
51	SAN JOSE STATE UNIV	Ballard, R.	ARC	Holley, D.	NAG 2-594	1646
51	SAN JOSE STATE UNIV	Winget, C. M.	ARC	Holley, D. C.	NCA 2-203	1650
51	SAN JOSE STATE UNIV	Daunton, N. G.	ARC	Fox, R. A.	NCC 2-167	1663
51	SAN JOSE STATE UNIV	Corcoran, M. L.	ARC	Fox, R. A.	NCC 2-449	1673
51	SAN JOSE STATE UNIV	Winget, C. M.	ARC	Holley, D. C.	NCC 2-593	1677
51	SAN JOSE STATE UNIV	Grindeland, R. E.	ARC	Yengoyan, L. S.	NCC 2-611	1679
51	SAN JOSE STATE UNIV	Owens, F. C.	HQ-XE	Fox, R. A.	NGT 00-070-137	1685
51	SANTA CLARA UNIV	MacElroy, R. D.	ARC	Klein, H. P.	NCA 2-161	2343
51	SANTA CLARA UNIV	Jahnke, L. L.	ARC	Klein, H. P.	NCA 2-226	2345
51	SANTA CLARA UNIV	Hochstein, L. I.	ARC	Tomlinson, G. A.	NCA 2-250	2346
51	SANTA CLARA UNIV	Grindeland, R.	ARC	Fast, T.	NCC 2-406	2351
51	SO ILL UNIV-CARBONDL	Winget, C. M.	ARC	Ferraro, J. S.	NAG 2-452	3016
51	STANFORD UNIVERSITY	MacElroy, R. D.	ARC	Roughgarden, J.	NCA 2-258	1767
51	STANFORD UNIVERSITY	Averner, M. M.	HQ-EB	Vitousek, P.	NAGW 1068	1734
51	STATE U NY-BINGHAMTN	Sauer, R. L.	JSC	Janauer, G. E.	NAG 9-307	4678
51	STATE U NY-STONY BRK	Knott, W. M.	KSC	Krikorian, A. D.	NAS10-11395	4724
51	STATE U NY-STONY BRK	Halstead, T. W.	HQ-EB	Krikorian, A. D.	NSG 7270	4729
51	TEXAS A&M UNIVERSITY	Kutyna, F. A.	JSC	Lessard, C. S.	NAG 9-303	5663
51	TEXAS SOUTHERN UNIV	Henninger, D. L.	JSC	Wilson, R. F.	NAG 9-174	5702
51	TULANE UNIVERSITY	Hochstein, L. L.	ARC	Johnson, E. J.	NCA 2-370	3425
51	TULANE UNIVERSITY	MacElroy, R. D.	ARC	Johnson, E. J.	NCA 2-800501	3426
51	TUSKEGEE UNIVERSITY	Philpott, D. E.	ARC	Sapp, W. J.	NCC 2-455	1071
51	UNIV ALA-BIRMINGHAM	Herren, B.	MSFC	Bugg, C. E.	NAS 8-36611	1082
51	UNIV ALA-BIRMINGHAM	Oran, W. A.	HQ-IC	Bugg	NAGW 813	1080
51	UNIV ALA-HUNTSVILLE	Pierson, D.	JSC	Kilgore, M. V.	NAS 9-17973	1178
51	UNIV OF ARIZONA	Winget, C. M.	ARC	Tischler, M. E.	NAG 2-384	1293
51	UNIV OF ARIZONA	Halstead, T. W.	HQ-EB	Gruener, R. P.	NAGW 1325	1391
51	UNIV OF ARIZONA	Crouch, R. K.	HQ-EN	Bier, M.	NAGW 693	1356
51	UNIV OF ARIZONA	Owens, F. C.	HQ-XE	Levine, M. L.	NGT 00-050-270	1453
51	UNIV OF ARIZONA	Owens, F. C.	HQ-LE	Tischler, M. E.	NGT 00-050-019	1442
51	U ARKANSAS-PINE BLUF	Daunton, N. G.	ARC	Walker, C. A.	NAG 2-427	1493
51	UNIV CALIF-BERKELEY	Ross, M. D.	ARC	Lewis, E. R.	NAG 2-448	1867
51	UNIV CALIF-BERKELEY	Holton, E. M.	ARC	Wilt, F. H.	NAG 2-572	1869
51	UNIV CALIF-BERKELEY	MacElroy, R. D.	ARC	Packer, L.	NCA 2-140	1942
51	UNIV CALIF-BERKELEY	Halstead, T. W.	HQ-EB	Feldman, L. J.	NAGW 239	1895
51	UNIV CALIF-BERKELEY	Fogleman, S. W.	HQ-EB	Buchanan, B. B.	NAGW 427	1897
51	UNIV CALIF-BERKELEY	Rummel, J. D.	HQ-EB	Jukes, T. H.	NAGW 1521	1913
51	UNIV CALIF-BERKELEY	Owens, F. C.	HQ-LE	Feldman, L. J.	NGT 00-050-017	1976
51	UNIV CALIF-DAVIS	Holton, E. M.	ARC	Horowitz, J. M.	NAG 2-341	2001
51	UNIV CALIF-DAVIS	Holton, E.	ARC	Fuller, C. A.	NAG 2-349	2002
51	UNIV CALIF-DAVIS	Connolly, J. P.	ARC	Fuller, C. A.	NAG 2-587	2008
51	UNIV CALIF-DAVIS	Donnelly, N. J.	ARC	Fuller, C.	NAS 2-12334	2018
51	UNIV CALIF-DAVIS	MacElroy, R. D.	ARC	Huffaker, R. C.	NCC 2-392	2034
51	UNIV CALIF-DAVIS	McKay, C. P.	ARC	Harrison, A. A.	NCC 2-469	2035
51	UNIV CALIF-DAVIS	Hargens, A. R.	ARC	Jones, J. H.	NCC 2-567	2036
51	UNIV CALIF-DAVIS	Halstead, T. W.	HQ-EB	Horowitz, J. M.	NAGW 1458	2016
51	UNIV CALIF-DAVIS	Owens, F. C.	HQ-XE	Fuller, C. A.	NGT 00-050-195	2039
51	UNIV CALIF-DAVIS	Owens, F. C.	HQ-XE	Fuller, C. A.	NGT 00-050-458	2040
51	UNIV CALIF-IRVINE	Ross, M. D.	ARC	Blanks, R. H.	NAG 2-399	2044
51	UNIV CALIF-IRVINE	Leon, H. A.	ARC	Baldwin, K. M.	NAG 2-555	2045
51	UNIV CALIF-IRVINE	Ballard, R. W.	ARC	Baldwin, K. M.	NAS 2-10522	2051
51	UNIV CALIF-IRVINE	Rummel, J. D.	HQ-EB	Lanyi, T. K.	NAGW 212	2049
51	UNIV CALIF-L ANGELES	Grindeland, R. E.	ARC	Roy, R. R.	NCA 2-268	2135
51	UNIV CALIF-L ANGELES	Grindeland, R. E.	ARC	Edgerton, V. R.	NCA 2-390502	2143
51	UNIV CALIF-L ANGELES	Ballard, R. W.	ARC	Edgerton, V. R.	NCC 2-535	2145
51	UNIV CALIF-L ANGELES	Sams, C. F.	JSC	Kasper, C. E.	NAG 9-323	2095
51	UNIV CALIF-SAN DIEGO	Hargens, A.	ARC	Amiel, D.	NCC 2-557	2246

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51	UNIV CALIF-SAN DIEGO	White, R. J.	HQ-EB	West, J. B.	NAGW 897	2209
51	UNIV CALIF-SAN DIEGO	Rummel, J. D.	HQ-EB	Arrhenius, G.	NAGW 1031	2213
51	UNIV CALIF-SAN DIEGO	Owens, F. C.	HQ-XE	Felbeck, H.	NGT 00-050-277	2260
51	UNIV CALIF-SAN FRAN	Holton, E. M.	ARC	Ganong, W. F.	NAG 2-434	2267
51	UNIV CALIF-SAN FRAN	Holton, E. M.	ARC	Bikle, D. D.	NCC 2-328	2277
51	UNIV CALIF-SAN FRAN	Danellis, J. V.	ARC	Dallman, M. F.	NCC 2-354	2278
51	UNIV CALIF-SAN FRAN	Corcoran, M. L.	ARC	Ralston, H. J.	NCC 2-491	2279
51	UNIV CALIF-SAN FRAN	Arnaud, S. B.	ARC	Holton, E. M.	NCC 2-589	2280
51	UNIV CALIF-SAN FRAN	Holton, E. M.	ARC	Cann, C. E.	NCC 2-597	2281
51	UNIV CALIF-SAN FRAN	Halstead, T. W.	HQ-EB	Fulford, M. H.	NAGW 1244	2272
51	UNIV CALIF-SAN FRAN	Halstead, T. W.	HQ-EB	Ganong, W. F.	NAGW 1611	2273
51	UNIV CALIF-SAN FRAN	Owens, F. C.	HQ-LE	Bikle, D.	NGT 05-029-801	2282
51	UNIV OF CHICAGO	Daunton, N. G.	ARC	Goldberg, J. M.	NAG 2-148	3019
51	UNIV OF CHICAGO	Des Marais, D. J.	ARC	Raup, D. M.	NAG 2-237	3020
51	UNIV OF CINCINNATI	Carle, G. C.	ARC	Vestal, J. R.	NCA 2-366	5126
51	UNIV OF DELAWARE	Averner, M. M.	HQ-EB	Klenas, V.	NAGW 374	2620
51	UNIV OF HAWAII-MANOA	Devincenzi, D. L.	HQ-EB	Folsome, C. E.	NGR 12-001-109	2976
51	UNIV HOUSTON-HOUSTON	Rummel, J. D.	HQ-EB	Fox, G. E.	NSG 7440	5754
51	UNIV HOUSTON-HOUSTON	Oran, W. A.	HQ-IC	Chu, C. W.	NAGW 977	5738
51	UNIV ILLINOIS-CHICGO	Des Marais, D. J.	ARC	Sepkoski Jr., J. J.	NAG 2-282	3094
51	UNIV OF LOUISVILLE	Grindeland, R. E.	ARC	Musacchia, X. J.	NAG 2-386	3391
51	UNIV OF LOUISVILLE	Halstead, T. W.	HQ-EB	Musacchia, X. J.	NAGW 70	3393
51	U OF MED & DEN-CAMDN	Owens, F. C.	HQ-XE	Stein, T. P.	NGT 00-070-033	4375
51	UNIV MICH-ANN ARBOR	Corcoran, M. L.	ARC	Welsh, M. J.	NAG 2-325	3983
51	UNIV MICH-ANN ARBOR	Halstead, T. W.	HQ-EB	Kaufman, P. B.	NAGW 34	4021
51	UNIV MICH-ANN ARBOR	Halstead, T. W.	HQ-EB	Kaufman, P.	NAGW 1600	4042
51	UNIV MICH-ANN ARBOR	Owens, F. C.	HQ-LE	Kaufman, P. B.	NGT 00-070-004	4083
51	UNIV NEBRASKA-LINCLN	Halstead, T. W.	HQ-EB	Jones, T. A.	NAGW 1275	4248
51	UNIV NEW HAMP-DURHAM	MacElroy, R. D.	ARC	Moore, B.	NCC 2-27	4304
51	UNIV NEW HAMP-DURHAM	Averner, M. M.	HQ-EB	Moore, B.	NAGW 714	4290
51	UNIV N CAR-CHPL HILL	Arnaud, S. B.	ARC	Dillaman, R. M.	NAG 2-391	4823
51	UNIV OF PACIFIC	Holton, E. M.	ARC	Roberts, W. E.	NAG 2-322	2331
51	UNIV OF PACIFIC	Holton, E. M.	ARC	Roberts, W. E.	NCC 2-224	2334
51	U PUERTO RICO-MAYAGZ	Owens, F. C.	HQ-LE	Gonzalez, J. G.	NGT 51-001-800	6479
51	U PUERTO RICO-RIO PI	Owens, F. C.	HQ-XE	Fetcher, N.	NGT 00-050-256	6480
51	UNIV SAN FRANCISCO	Nachtwey, D. S.	JSC	Benton, E. V.	NAS 9-17389	2341
51	UNIV OF SO FLORIDA	Rummel, J. D.	HQ-EB	Briggs, J. C.	NAGW 1173	2828
51	UNIV OF SOUTHERN CAL	Owens, F. C.	HQ-LE	Kiefer, D. A.	NGT 00-050-091	2373
51	UNIV TENNESSEE-KNOXV	Mandel, A. D.	ARC	Lange, R. D.	NAG 2-494	5508
51	U OF TEN CTR HLTH&SC	Schatte, C. L.	ARC	Lange, R. D.	NAS 2-11586	5528
51	UNIV TEXAS-AUSTIN	Gonda, S. R.	JSC	Brown, R. M.	NAG 9-397	5810
51	UNIV TEXAS-AUSTIN	Halstead, T. W.	HQ-EB	Roux, S. J.	NAGW 1519	5817
51	UNIV TEXAS-AUSTIN	Halstead, T. W.	HQ-EB	Roux, S. J.	NSG 7480	5857
51	U TEX MED BRANCH-GAL	Daunton, N. G.	ARC	Perachio, A. A.	NAG 2-26	5890
51	U TEX MED BRANCH-GAL	Tomko, D. L.	ARC	Correia, M. J.	NAG 2-186	5891
51	U TEX MED BRANCH-GAL	Daunton, N. G.	ARC	Gallagher, J. P.	NAG 2-260	5892
51	U TEX MED BRANCH-GAL	Daunton, N. G.	ARC	Correia, M. H.	NAG 2-293	5893
51	U TEX MED BRANCH-GAL	Connolly, J. P.	ARC	Correia, M. J.	NAG 2-446	5894
51	U TEX MED BRANCH-GAL	Owens, F. C.	HQ-XE	Perachio, A. A.	NGT 00-050-165	5899
51	U TEX HLTH SC CTR-HU	Winget, C. M.	ARC	Duke, C.	NCC 2-423	5913
51	U TEX HLTH SC CTR-HU	Tomko, D. L.	ARC	Crow, T. J.	NCC 2-558	5914
51	U TEX HLTH SC CTR-HU	Morrison, D. R.	JSC	Tom, B. H.	NAS 9-17403	5912
51	U TEX HLTH SC CTR-SA	Ross, M. D.	ARC	Wiederhold, M. L.	NAG 2-442	5915
51	UNIV OF UTAH	Arnaud, S. B.	ARC	Jee, W. S.	NAG 2-435	5928
51	UNIV OF VIRGINIA	Rummel, J. D.	HQ-EB	Kretsinger, R. H.	NAGW 1233	6129
51	UNIV OF WASHINGTON	Averner, M. M.	HQ-EB	Richey, J. E.	NAGW 1066	6296
51	UNIV OF WASHINGTON	Halstead, T. W.	HQ-EB	Cleland, R. E.	NAGW 1394	6309
51	UNIV WISC-MADISON	Hower, W. L.	ARC	Coe, L.	NAS 2-12939	6430
51	UNIV WISC-MADISON	MacElroy, R. D.	ARC	Tibbitts, T. W.	NCC 2-301	6444
51	UNIV WISC-MADISON	Holton, E. M.	ARC	Vailas, A. C.	NCC 2-619	6446

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51	UNIV WISC-MADISON	Oran, W.	HQ-IC	Bula, R. J.	NAGW 975	6417
51	UNIV WISC-MADISON	Owens, F. C.	HQ-XE	Becker, W.	NGT 00-050-267	6450
51	UNIV WISC-MILWAUKEE	Averner, M. M.	HQ-EB	Nealson, K. H.	NAGW 1063	6459
51	UTAH STATE UNIV	MacElroy, R. D.	ARC	Salisbury, F. B.	NCC 2-139	5956
51	VIRGINIA POLY INST	McKay, C. P.	ARC	Simmons, G. M.	NCA 2-316	6225
51	VIRGINIA POLY INST	Halstead, T. W.	HQ-EB	Lewis, N. G.	NAGW 1277	6219
51	WAKE FOREST UNIV	Ferandin, J.	ARC	Hutchins, P. M.	NAS 2-10523	4838
51	WAKE FOREST UNIV	Owens, F. C.	HQ-XE	Hutchins, P.	NGT 00-070-081	4840
51	WASHINGTON UNIVERSTY	Tomko, D. L.	ARC	Paige, G. D.	NCC 2-627	4212
51	WASHINGTON UNIVERSTY	Alexander, J. K.	HQ-E	Pickard, B. G.	NAGW 1728	4205
51	WAYNE STATE UNIV	Ross, M. D.	ARC	Kerr, T. P.	NAG 2-404	4093
51	WILLIAMS COLLEGE	Halstead, T. W.	HQ-EB	Slocum, R. D.	NAGW 1382	3939
51	WILLIAMS COLLEGE	Halstead, T. W.	HQ-ER	Sloam, R. D.	NAGW 1049	3938
51	WOODSHOLE OCEAN INST	Averner, M.	HQ-EB	Dacey, J. H.	NAGW 606	3941
51	WRIGHT STATE UNIV	Daunton, N. G.	ARC	Crampton, G. H.	NCC 2-229	5176
51	WRIGHT STATE UNIV	Boyce, J.	JSC	Hamilton, G. C.	NAG 9-263	5174
51	YALE UNIVERSITY	Averner, M. M.	HQ-EB	Galston, A. W.	NAGW 1402	2606
51	YALE UNIVERSITY	Halstead, T. W.	HQ-EB	Galston, A. W.	NSG 7290	2613
54	ALABAMA A&M UNIV	MacElroy, R. D.	ARC	Brooks, C.	NCC 2-607	1022
54	COLORADO STATE UNIV	Soffen, G.	GSFC	Schimmel, D. S.	NAS 5-33007	2395
54	COLORADO STATE UNIV	Nachtwey, D. S.	JSC	Lett, J.	NAG 9-10	2391
54	HOWARD UNIVERSITY	Matson, P. A.	ARC	Dahlin, B. H.	NAG 2-585	2688
54	MASS INST OF TECH	Yates, I. C.	MSFC	Gatos, H. C.	NAS 8-36604	3844
54	NEW YORK UNIVERSITY	Rummel, J. D.	HQ-EB	Rampino, M. R.	NAGW 1697	4611
54	NO CAROLINA STATE U	Peterson, D. L.	ARC	Hitchner, L. E.	NCA 2-247	4806
54	NORTHERN ARIZONA U	Matson, P. A.	ARC	Bowman, A.	NCA 2-141	1285
54	OHIO STATE UNIV	Halstead, T. W.	HQ-EB	Sack, F. D.	NAGW 780	5044
54	OREGON STATE UNIV	Lawless, J. G.	ARC	English, M. E.	NCC 2-569	5208
54	OREGON STATE UNIV	Lesane, G.	HQ-EE	Ropple, W. J.	NAGW 1460	5203
54	PRAIRIE VIEW A&M U	Peterson, D. L.	ARC	Brams, E. A.	NAG 2-400	5567
54	SAN JOSE STATE UNIV	Matson, P.	ARC	Savage, W.	NCA 2-145	1649
54	STATE UNIV NY-ALBANY	Sauer, R.	JSC	Janauer, G. E.	NAS 9-16604	4667
54	UNIV CALIF-DAVIS	Winget, C. M.	ARC	Fuller, C. A.	NAG 2-467	2004
54	UNIV CALIF-DAVIS	Winget, C. M.	ARC	Fuller, C. A.	NAG 2-562	2007
54	UNIV CALIF-DAVIS	Sebesta, P.	ARC	Washino, R.	NCA 2-153	2021
54	UNIV CALIF-DAVIS	Lawless, J. G.	ARC	Ustin, S. L.	NCA 2-229	2024
54	UNIV CALIF-DAVIS	Sebesta, P. D.	ARC	Washino, R. K.	NCA 2-428	2028
54	UNIV CALIF-S BARBARA	Soffen, G.	GSFC	Dozier, J.	NAS 5-30555	2302
54	UNIV OF GEORGIA	Luvall, J. C.	SSC	Welch, R. A.	NAG13-10	2921
54	UNIV OF MAINE-ORONO	Averner, M. M.	HQ-EB	King, G. M.	NAGW 1428	3438
54	UNIV OF MASS-AMHERST	Rummel, J. D.	HQ-EB	Margulis, L.	NAGW 1524	3916
54	UNIV OF MONTANA	Peterson, D. L.	ARC	Running, S. W.	NCA 2-252	4234
54	UNIV NEW HAMP-DURHAM	Peterson, D. L.	ARC	Aber, J. D.	NCA 2-238	4303
54	UNIV NEW HAMP-DURHAM	Soffen, G.	GSFC	Moore, E.	NAS 5-30558	4301
54	UNIV NEW HAMP-DURHAM	Averner, M. M.	HQ-EB	Harriss, R.	NAGW 1726	4298
54	U PUERTO RICO-MAYAGZ	Owens, F. C.	HQ-XE	Lawrence, W. T.	NGT 00-070-141	6476
54	UNIV WISC-MADISON	Tri, T. O.	JSC	Bach-y-rita, P.	NAG 9-171	6408
54	UNIV WISC-MADISON	Knott, W.	KSC	Schatten, H.	NAG10-64	6427
54	UNIV WISC-MILWAUKEE	Rodgers, E. B.	MSFC	Boraas, M. E.	NAS 8-37914	6460
54	UNIV WISC-MILWAUKEE	Wickland, D. E.	HQ-EE	Nealson, K. H.	NAGW 1047	6458
54	UTAH STATE UNIV	Knott, W. M.	KSC	Salisbury, F. B.	NAG10-63	5950
54	WRIGHT STATE UNIV	Halstead, T. W.	HQ-EB	Moore, R.	NAGW 1738	5175
55	AUBURN UNIV-AUBURN	Carter, G. A.	SSC	Mitchell, R. J.	NAG13-7	1035
55	CORNELL UNIVERSITY	Owens, F. C.	HQ-XE	Leopold, A. C.	NGT 00-050-197	4576
55	GEORGE WASHINGTON U	Oseroff, H.	GSFC	Chauhan, N.	NAG 5-265	2666
55	JOHNS HOPKINS UNIV	Owens, F. C.	HQ-LE	Paor, D. D.	NGT 00-050-054	3489
55	MASS INST OF TECH	Oseroff, H.	GSFC	Oliver, D. O.	NAG 5-270	3752
55	NO CAROLINA STATE U	MacElroy, R.	ARC	Raper, C. D., Jr.	NCC 2-101	4820
55	OHIO STATE UNIV	Halstead, T. W.	HQ-EB	Raghavan, V.	NAGW 901	5045
55	PURDUE UNIVERSITY	MacElroy, R. D.	ARC	Mitchell, C. A.	NCC 2-100	3231

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55	PURDUE UNIVERSITY	Knott, W. M.	KSC	Mitchell, C. A.	NAG10-18	3226
55	PURDUE UNIVERSITY	Knott, W. M.	KSC	Mitchell, C. A.	NAG10-53	3227
55	RUTGERS ST U-PISCTWY	MacElroy, R. D.	ARC	Janes, H.	NCA 2-424	4371
55	UNIV CALIF-BERKELEY	Owens, F. C.	HQ-XE	Townes, C. H.	NGT 00-050-278	1985
55	UNIV CALIF-DAVIS	MacElroy, R. D.	ARC	Huffaker, R. C.	NCC 2-99	2031
55	UNIV CALIF-L ANGELES	Knott, W. M.	KSC	Berry, W. L.	NAG10-52	2123
55	UNIV OF CONNECTICUT	Knott, W. M.	KSC	Koontz, H.	NCC10-2	2591
55	UNIV HOUSTON-HOUSTON	Henninger, D. L.	JSC	Venketeswaran, S.	NAG 9-214	5720
55	UNIV OF KANSAS	Oseroff, H.	GSFC	Moore, R. K.	NAG 5-271	3358
55	UNIV MICH-ANN ARBOR	Oseroff, H.	GSFC	Ulaby, F. T.	NAG 5-480	4001
55	UNIV TEXAS-ARLINGTON	Oseroff, H.	GSFC	Fung, A. K.	NAG 5-486	5757
55	WASHINGTON ST UNIV	Knott, W. M.	KSC	Poovaliah, B. W.	NAG10-32	6346
55	WEST VIRGINIA UNIV	Owens, F. C.	HQ-XE	Dwivedi, S. N.	NGT 00-070-143	6360
56	BAYLOR COL OF MED	Schneider, V.	JSC	Leblanc, A.	NAG 9-130	5555
56	BAYLOR COL OF MED	Huntoon, C. L.	JSC	Alfrey, C.	NAS 9-14662	5557
56	BAYLOR COL OF MED	Huntoon, C.	JSC	Suki, W.	NAS 9-17589	5558
56	BAYLOR COL OF MED	Booker, F.	JSC	Alfrey, C. P.	NAS 9-18024	5559
56	BAYLOR COL OF MED	Morrison, D.	JSC	Alassi, M. Z.	NAS 9-18065	5560
56	BAYLOR COL OF MED	Leviton, B.	JSC	Leblanc, A.	NAS 9-18076	5561
56	BAYLOR COL OF MED	Alexander, J. K.	HQ-E	Cardus, D.	NAGW 1691	5556
56	BAYLOR COL OF MED	Owens, F. C.	HQ-XE	Atassi, M. Z.	NGT 00-050-225	5562
56	BRANDEIS UNIVERSITY	Kutyna, F. A.	JSC	Lackner, J. R.	NAG 9-295	3661
56	CASE WESTERN RESERVE	Friedman, D. S.	GSFC	Ko, W. H.	NAS 5-29423	4896
56	CASE WESTERN RESERVE	Harris, J. W.	JSC	Leigh, R. J.	NAS 9-17439	4897
56	COLUMBIA UNIVERSITY	Grindeland, R. E.	ARC	Wolgemuth, D. J.	NAG 2-597	4456
56	COLUMBIA UNIVERSITY	Arnaud, S. B.	ARC	Pawluk, R. J.	NCA 2-172102	4496
56	COLUMBIA UNIVERSITY	Nachtwey, D. S.	JSC	Worgul, D.	NAG 9-256	4480
56	DUKE UNIVERSITY	Horrigan, D. J.	JSC	Vann, R. D.	NAG 9-134	4758
56	E VA MED SC-HMPTN RD	Halstead, T.	HQ-EB	Spangenberg, D. B.	NAGW 1784	5995
56	FORDHAM UNIVERSITY	Goldstein, S. H.	JSC	Nissim, L. J.	NAG 9-399	4593
56	HARVARD UNIVERSITY	Cintron, N. M.	JSC	Hollenberg, N. K.	NAG 9-17	3678
56	HARVARD UNIVERSITY	Cintron, N. M.	JSC	Ede, M. C.	NAG 9-264	3679
56	LA STATE U-SHREVEPT	Kutyna, F. A.	JSC	Choy, F. K.	NAG 9-167	3411
56	MASS INST OF TECH	Cintron, N. M.	JSC	Wurtman, R. J.	NAG 9-144	3788
56	MASS INST OF TECH	Kutyna, F. A.	JSC	Oman, C. M.	NAG 9-244	3789
56	MASS INST OF TECH	White, R. J.	HQ-EB	Cohen, R. J.	NAGW 988	3802
56	MED COL OF WISC	Grindeland, R. E.	ARC	Riley, D. A.	NAG 2-460	6366
56	MT SINAI SCH OF MED	Stoklosa, J. H.	HQ-EB	Cohen, B.	NAGW 1701	4599
56	PA ST U-HERSHEY MED	Kutyna, F. A.	JSC	Koch, K.	NAG 9-118	5274
56	PENN STATE U-UNIV PK	Grindeland, R. E.	ARC	Hymer, W. C.	NAG 2-598	5293
56	PENN STATE U-UNIV PK	Grindeland, R. E.	ARC	Mastro, A. M.	NAG 2-599	5294
56	PENN STATE U-UNIV PK	Morrison, D.	JSC	Hymer, W.	NAS 9-17416	5345
56	RICE UNIVERSITY	Wolf, D.	JSC	McIntire, I. V.	NAG 9-207	5587
56	STANFORD UNIVERSITY	Owens, F. C.	HQ-XE	Hargens, A.	NGT 00-050-350	1845
56	STATE UNIV NY-BUFFAL	Owens, F. C.	HQ-XE	Farhi, L. E.	NGT 00-050-202	4699
56	ST U NY HCS-BROOKLYN	Grindeland, R. E.	ARC	Etlinger, J. D.	NAG 2-531	4732
56	THOMAS JEFFERSON U	Harris, B.	JSC	Herbison, G. J.	NAG 9-133	5377
56	TULANE UNIVERSITY	Mehler, W. R.	ARC	Brizzee, K. R.	NAG 2-101	3421
56	TULANE UNIVERSITY	Owens, F. C.	HQ-XE	Walker, B. R.	NGT 00-050-176	3427
56	UNIV CALIF-L ANGELES	Grindeland, R. E.	ARC	Edgerton, V. R.	NAG 2-450	2065
56	UNIV CALIF-L ANGELES	Kutyna, F. A.	JSC	Markham, C. H.	NAG 9-179	2094
56	UNIV CALIF-SAN DIEGO	Hargens, A. R.	ARC	Sartoris, D. J.	NCC 2-556	2245
56	UNIV CALIF-SAN DIEGO	Charles, J. B.	JSC	West, J. B.	NAG 9-271	2202
56	UNIV CALIF-SAN FRAN	Kirk, P. J.	ARC	Kamiya, J. J.	NCC 2-115	2275
56	UNIV CALIF-SAN FRAN	Schneider, V. S.	JSC	Cann, C. E.	NAG 9-327	2269
56	UNIV CALIF-SAN FRAN	Schneider, V. S.	JSC	Genant, H. K.	NAG 9-343	2270
56	UNIV COLORADO-DENVER	Sams, C.	JSC	Meehan, R.	NAG 9-384	2570
56	U COL HLTH SCI CTR	Taylor, G. R.	JSC	Meehan, R. T.	NAG 9-377	2573
56	UNIV OF FLORIDA	Koller, A.	KSC	Grams, R. R.	NAG10-41	2787
56	UNIV OF FLORIDA	Long, I. D.	KSC	Melker, R. J.	NAS10-11495	2794

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56	UNIV HOUSTON-HOUSTON	Stewart, D.	JSC	Brown, J. H.	NAG 9-225	5724
56	UNIV OF KANSAS	Grindeland, R. E.	ARC	Festoff, B. W.	NAG 2-600	3356
56	UNIV OF KENTUCKY	Charles, J. B.	JSC	Knapp, C. F.	NAG 9-298	3388
56	UNIV OF LOUISVILLE	Taylor, G. R.	JSC	Sonnenfeld, G.	NAG 9-181	3392
56	UNIV MARYLAND-BALT	Kutyna, F. A.	JSC	Drusano, G. L.	NAG 9-249	3505
56	UNIV OF MASS-AMHERST	Kutyna, F. A.	JSC	Andres, R. O.	NAG 9-291	3906
56	U OF MED & DEN-CAMDN	Newkirk, K.	JSC	Stein, P.	NAS 9-17276	4374
56	UNIV N CAR-CHPL HILL	Arnaud, S. B.	ARC	Mechanic, G.	NAG 2-181	4822
56	UNIV OF PENNSYLVANIA	Waligora, J. M.	JSC	Lambertson, C. J.	NAG 9-154	5385
56	UNIV OF PENNSYLVANIA	Waligora, J. M.	JSC	Lambertsen, C. J.	NAG 9-342	5386
56	UNIV TENNESSEE-KNOXV	Cintron, N. M.	JSC	Lange, R. D.	NAG 9-367	5517
56	UNIV TEXAS-AUSTIN	Savely, R. T.	JSC	Himmelblau, D. M.	NAG 9-287	5801
56	U TEX MED BRANCH-GAL	Taylor, G. R.	JSC	Meehan, R. T.	NAG 9-170	5895
56	U TEX MED BRANCH-GAL	Cintron, N. M.	JSC	Stuart, C. A.	NAG 9-172	5896
56	U TEX MED BRANCH-GAL	Sams, C. F.	JSC	Meehan, R. T.	NAG 9-306	5897
56	U TEX SW MED CTR-DA	Cintron, N. M.	JSC	Pak, C. Y.	NAG 9-152	5900
56	U TEX SW MED CTR-DA	Charles, J. B.	JSC	Buckey, J. C.	NAG 9-267	5901
56	U TEX SW MED CTR-DA	Charles, J. B.	JSC	Buckey, J. C.	NAG 9-297	5902
56	U TEX SW MED CTR-DA	Young, W.	JSC	Blomqvist, G.	NAS 9-16044	5903
56	U TEX SW MED CTR-DA	Young, W.	JSC	Blomqvist, G.	NAS 9-18139	5905
56	U TEX HLTH SC CTR-HU	Grindeland, R. E.	ARC	Booth, F. W.	NAG 2-239	5908
56	U TEX HLTH SC CTR-HU	Harris, B.	JSC	Steiner, A.	NAG 9-193	5909
56	U TEX HLTH SC CTR-HU	Waligora, J. M.	JSC	Butler, B. D.	NAG 9-215	5910
56	U TEX HLTH SC CTR-HU	Pool, S.	JSC	Schneider, V.	NAG 9-335	5911
56	U TEX HLTH SC CTR-SA	Schneider, V. S.	JSC	Holt, G. R.	NAG 9-250	5916
56	UNIV WISC-MADISON	Grindeland, R. E.	ARC	Vailas, A. C.	NAG 2-568	6376
56	VANDERBILT UNIVERSTY	Gilbert, R. L.	HQ	Wang, T. G.	NAGW 1707	5537
56	VIRGINIA COMNWLTH U	Samos, J.	LARC	Patterson, J. L.	NAG 1-695	6158
56	VIRGINIA COMNWLTH U	Yost, W. T.	LARC	Marmarou, A.	NCC 1-87	6162
56	VIRGINIA COMNWLTH U	Sulzman, F.	HQ-EB	Eckberg, D. L.	NAGW 1178	6159
56	VIRGINIA COMNWLTH U	Stoklosa, J.	HQ-EB	Eckberg, D.	NAGW 1528	6160
56	WASHINGTON ST UNIV	Sauer, R. L.	JSC	Bull, R. J.	NAG 9-226	6344
56	WASHINGTON ST UNIV	Schneider, V.	JSC	Gollnick, P. D.	NAG 9-363	6345
56	WASHINGTON UNIVERSTY	Tomko, D.	ARC	Paige, G.	NCA 2-222	4211
56	WEST VIRGINIA UNIV	Grindeland, R. E.	ARC	Stauber, W. T.	NAG 2-590	6357
59	ALABAMA A&M UNIV	Randall, J. L.	MSFC	Kale, R.	NAG 8-97	1010
59	BRANDEIS UNIVERSITY	Kutyna, F.	JSC	Lackner, J. B.	NAS 9-15147	3662
59	COLUMBIA UNIVERSITY	Halstead, T.	HQ-EB	Wolgemuth, D. J.	NAGW 1579	4490
59	FLORIDA A&M UNIV	Margolis, M.	HQ-U	Redda, K.	NGT 10-040-900	2719
59	GEORGE WASHINGTON U	Halstead, T.	HQ-EB	Dutcher, F. R.	NASW 4324	2674
59	MASS INST OF TECH	MacElroy, R. D.	ARC	Karel, M.	NCC 2-231	3851
59	MASS INST OF TECH	Proctor, D. R.	JSC	Young, L. R.	NAS 9-16523	3846
59	MISSISSIPPI STATE U	Morrison, D.	JSC	Rundell, R.	NAS 9-17319	4159
59	MT SINAI SCH OF MED	Connolly, J. P.	ARC	Cohen, B.	NAG 2-573	4598
59	NEW YORK UNIVERSITY	MacElroy, R. D.	ARC	Volk, T.	NCA 2-101	4612
59	OREGON HLTH SCNCS U	Gardner, L. B.	MSFC	Brooks, D. E.	NAS 8-35333	5190
59	OREGON STATE UNIV	Owens, F. C.	HQ-XE	Lomax, T.	NGT 00-050-455	5213
59	PENN STATE U-UNIV PK	Morrison, D.	JSC	Todd, P.	NAS 9-17431	5346
59	SAN FRAN STATE UNIV	Carle, G. C.	ARC	Banin, A.	NCC 2-352	1641
59	SAN JOSE STATE UNIV	Carle, G. C.	ARC	Ling, A. C.	NCC 2-345	1670
59	STATE UNIV NY-ALBANY	Carle, G. C.	ARC	Scattergood, T. W.	NCC 2-395	4672
59	STATE UNIV NY-BUFFAL	Lafferty, P.	JSC	Farhi, L.	NAS 9-16042	4696
59	STATE U NY-STONY BRK	Halstead, T.	HQ-EB	Krikorian, A. D.	NAGW 1529	4719
59	TEXAS A&M UNIVERSITY	Cullingford, H. S.	JSC	Wolfe, J. C.	NAG 9-253	5656
59	TEXAS SOUTHERN UNIV	Bourland, C. T.	JSC	Ahmed, S. M.	NAG 9-325	5705
59	TULANE UNIVERSITY	Halstead, T. W.	HQ-EB	Fermin, C. D.	NAGW 1516	3424
59	UNIV ALA-HUNTSVILLE	Hueter, U.	MSFC	Crump, W. J.	NAG 8-698	1126
59	UNIV ALA-HUNTSVILLE	Gardner, L. B.	MSFC	Harris, J. M.	NAS 8-35362	1156
59	UNIV OF ARIZONA	Hargers, A. R.	ARC	Tipton, C. M.	NAG 2-392	1294
59	UNIV OF ARIZONA	Newkirk, K.	JSC	Crisswell, B. S.	NAS 9-16838	1425

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59	UNIV OF ARIZONA	Jex, D.	MSFC	Bier, M.	NAS 8-32950	1422
59	UNIV OF ARIZONA	Halstead, T.	HQ-EB	Gruener, R. P.	NAGW 1705	1411
59	UNIV OF ARIZONA	Owens, F. C.	HQ-XE	Tipton, C.	NGT 00-050-493	1465
59	UNIV CALIF-IRVINE	Seitz, W. W.	JSC	Petrofsky, J. S.	NAS 9-17767	2053
59	UNIV CALIF-SAN DIEGO	Davis, C.	JSC	West, C.	NAS 9-16037	2241
59	UNIV CALIF-SAN DIEGO	Brinton, H. C.	HQ-EL	McFadden, L. A.	NAGW 1274	2222
59	UNIV CALIF-SAN FRAN	Keil, L. C.	ARC	Ramsay, D. J.	NCC 2-194	2276
59	UNIV CALIF-SAN FRAN	Schneider, V. S.	JSC	Genant, H. K.	NAG 9-157	2268
59	UNIV CALIF-SAN FRAN	Newkirk, K. E.	JSC	Arnaud, C. D.	NAS 9-16227	2274
59	UNIV OF CHICAGO	Browne, I. D.	JSC	Sutton, S. R.	NAG 9-106	3039
59	UNIV COLORADO-BOLDR	Oran, W. A.	HQ-IC	Luttges, M.	NAGW 1197	2491
59	UNIV HOUSTON-HOUSTON	Sauer, R. L.	JSC	Flory, D. A.	NAG 9-328	5728
59	UNIV HOUSTON-HOUSTON	Santy, P. A.	JSC	Bell, L. E.	NAG 9-345	5729
59	UNIV OF MASS-AMHERST	Rummel, J. D.	HQ-EB	Irvine, W. M.	NAGW 1353	3912
59	UNIV NEVADA-DRI	Carle, G. C.	ARC	Wharton, R. A.	NCC 2-577	4252
59	UNIV OF PENNSYLVANIA	Waligora, J. M.	JSC	Lambertsen, C. J.	NAS 9-17238	5391
59	UNIV WISC-MADISON	Alexander, J. K.	HQ-E	Norman, J. M.	NAGW 1575	6421
59	VIRGINIA COMNWLT U	Young, W. J.	JSC	Exkberg, D. L.	NAS 9-16046	6161
59	WRIGHT STATE UNIV	Evans, F. D.	HQ-EB	Mohler, S.	NGT 36-024-790	5177
61	JOHNS HOPKINS UNIV	Johnston, J. C.	ARC	Yantis, S.	NCA 2-171	3485
61	MIAMI UNIVERSITY	Owens, F. C.	HQ-XE	Parker, D. E.	NGT 00-050-427	5002
61	STANFORD UNIVERSITY	Graeber, R. C.	ARC	Dement, W. C.	NCC 2-641	1829
61	UNIV CALIF-SAN DIEGO	Johnston, J. C.	ARC	Pashler, H. E.	NCA 2-414	2244
61	U MINN-MNPLS-ST PAUL	Owens, F. C.	HQ-XE	Gorham, E.	NGT 00-050-258	4134
62	HARVARD UNIVERSITY	Foushee, H. C.	ARC	Hackman, J. R.	NCC 2-457	3697
62	HARVARD UNIVERSITY	Chidester, T. R.	ARC	Langer, E. J.	NCC 2-623	3698
62	UNIV CALIF-DAVIS	Connors, M. M.	ARC	Harrison, A.	NCA 2-442	2029
62	UNIV CALIF-SAN DIEGO	Palmer, E. A.	ARC	Norman, D. A.	NCC 2-591	2247
62	UNIV OF MIAMI	Norman, S. D.	ARC	Wiener, E. L.	NCA 2-441	2816
62	UNIV OF MIAMI	Foushee, H. C.	ARC	Wiener, E. L.	NCC 2-524	2818
62	UNIV OF MIAMI	Foushee, H. C.	ARC	Wiener, E. L.	NCC 2-581	2819
62	UNIV TEXAS-AUSTIN	Foushee, H. C.	ARC	Helmreich, R. L.	NCC 2-286	5830
69	BRANDEIS UNIVERSITY	Owens, F. C.	HQ-XE	Lackner, J. R.	NGT 00-050-306	3664
69	CAL STATE U-HAYWARD	Cohen, M. M.	ARC	Stoper, A. E.	NCC 2-529	1605
69	COLUMBIA UNIVERSITY	Rosendhal, J. D.	HQ-E	Galanter, E.	NAGW 860	4484
69	ISRAEL INST OF TECH	Hart, S. G.	ARC	Gopher, D.	NAGW 1012	6498
69	ISRAEL INST OF TECH	Hart, S. G.	HQ-	Gopher, D.	NAGW 1128	6499
69	JOHNS HOPKINS UNIV	Johnston, J. C.	ARC	Yantis, S.	NCA 2-413	3486
69	NEW MEX ST U-LAS CR	Remington, R.	ARC	Papp, K. R.	NAG 2-453	4383
69	NEW MEX ST U-LAS CR	Hofstrand, R. F.	ARC	Paap, K. R.	NAG 2-543	4385
69	OHIO STATE UNIV	Hartzell, E. J.	ARC	Miller, R. A.	NAG 2-195	5009
69	OHIO STATE UNIV	Palmer, E. A.	ARC	Smith, P. J.	NCC 2-615	5058
69	OLD DOMINION UNIV	Owens, F. C.	HQ-XE	Coates, G. D.	NGT 00-050-405	6085
69	OLD DOMINION UNIV	Owens, F. C.	HQ-XE	Stoughton, J. W.	NGT 00-070-059	6088
69	OLD DOMINION UNIV	Owens, F. C.	HQ-LE	Coates, G. D.	NGT 00-050-120	6080
69	PENN COL OPTOMETRY	Fisher, S.	ARC	Whittaker, S.	NCA 2-202	5273
69	PENN STATE U-UNIV PK	Owens, F. C.	HQ-XE	Stern, R. M.	NGT 00-070-128	5370
69	PENN STATE U-UNIV PK	Owens, F. C.	HQ-XE	Stern, R. M.	NGT 00-070-129	5371
69	SAN JOSE STATE UNIV	Shafto, M. G.	ARC	Jordan, K.	NCC 2-327	1669
69	STANFORD UNIVERSITY	Ahumada, A. J.	ARC	Wandell, B. A.	NCC 2-307	1806
69	STANFORD UNIVERSITY	Lee, A. T.	ARC	Clark, H. H.	NCC 2-622	1827
69	STATE U NY-BINGHAMTN	Owens, F. C.	HQ-XE	Payne, D. G.	NGT 00-050-411	4681
69	SYRACUSE UNIVERSITY	Watson, A. B.	ARC	Pelli, D. G.	NCA 2-232	4741
69	SYRACUSE UNIVERSITY	Remington, R. W.	ARC	Folk, C. L.	NCA 2-390	4742
69	UNIV CALIF-BERKELEY	Bucher, N. M.	ARC	Young, L. R.	NCA 2-280	1951
69	UNIV CALIF-DAVIS	Clearwater, Y. A.	ARC	Coss, R. G.	NAG 2-428	2003
69	UNIV CALIF-DAVIS	Owens, F. C.	HQ-XE	Coss, R. G.	NGT 00-070-018	2041
69	UNIV CALIF-SAN DIEGO	Johnston, J. C.	ARC	Pashler, H.	NCA 2-225	2243
69	UNIV CALIF-S CRUZ	Watson, A.	ARC	Hitchner, L. E.	NCA 2-248	2317
69	UNIV ILLINOIS-URBANA	Hart, S. G.	ARC	Wickens, C. D.	NAG 2-308	3110

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69	UNIV ILLINOIS-URBANA	Hart, S.	ARC	Kramer, A. F.	NAG 2-369	3111
69	UNIV ILLINOIS-URBANA	Hart, S. G.	ARC	Donchin, E.	NAG 2-466	3112
69	UNIV ILLINOIS-URBANA	Hart, S. G.	ARC	Moray, N.	NAG 2-567	3113
69	UNIV ILLINOIS-URBANA	Hart, S. G.	ARC	Wickens, C.	NAG 2-584	3114
69	UNIV ILLINOIS-URBANA	Hart, S. G.	ARC	Donchin, E.	NCC 2-380	3147
69	UNIV ILLINOIS-URBANA	Johnson, W. W.	ARC	Andersen, G. J.	NCC 2-613	3150
69	UNIV ILLINOIS-URBANA	Hartzell, E. J.	ARC	Wickens, C. D.	NCC 2-632	3152
69	UNIV OF LOUISVILLE	Owens, F. C.	HQ-LE	Fell, R. D.	NGT 00-050-021	3394
69	UNIV OF MIAMI	Palmer, E.	ARC	Wiener, E.	NCC 2-377	2817
69	UNIV MICH-ANN ARBOR	Harrison, R. L.	ARC	Clipson, C. W.	NAG 2-440	3985
69	UNIV OF PENNSYLVANIA	Larimer, J. O.	ARC	Badler, N.	NAG 2-426	5378
69	UNIV OF SOUTHERN CAL	Hart, S. G.	ARC	Hancock, P. A.	NCC 2-379	2367
69	U TEX SW MED CTR-DA	Owens, F. C.	HQ-XE	Blomqvist, C. G.	NGT 00-050-206	5906
69	UNIV OF VIRGINIA	Kaiser, M. K.	ARC	Proffitt, D. R.	NCA 2-255	6137
69	UNIV OF WASHINGTON	Nagel, D. C.	ARC	Nelson, T. O.	NCA 2-299	6326
69	UNIV WISC-MADISON	Wenzel, E. M.	ARC	Wightman, F. L.	NCC 2-542	6445
71	COLORADO STATE UNIV	Owens, F. C.	HQ-LE	Omi, P. N.	NGT 00-050-094	2399
71	UNIV OF AKRON	Owens, F. C.	HQ-LE	Harris, F. W.	NGT 00-070-015	5107
71	UNIV OF CHICAGO	Owens, F. C.	HQ-XE	Dwyer, J. R.	NGT 00-050-272	3083
71	WASHINGTON UNIVERSTY	Owens, F. C.	HQ-LE	Simmons, D. J.	NGT 00-050-007	4214
73	AMERICAN UNIVERSITY	Fries, S. D.	HQ-LB	McCurdy, H. E.	NASW 4236	2632
73	GEORGE WASHINGTON U	Fries, S.	HQ	Logsdon, J. M.	NASW 4237	2673
73	GEORGE WASHINGTON U	Fries, S. D.	HQ	Logsdon, J. M.	NASW 4412	2675
73	UNIV OF KANSAS	Fries, S.	HQ-	Lewin, T. S.	NASW 4248	3367
73	UNIV MARYLAND-COL PK	Fries, S. D.	HQ-LB	Friedel, R. D.	NASW 4193	3600
75	GEORGIA SOUTHERN COL	Atkinson, J. D.	JSC	Tryman, N. D.	NAG 9-265	2905
76	TEXAS A&M UNIVERSITY	Owens, F. C.	HQ-XE	Ferrell, M. Z.	NGT 00-050-248	5687
79	INDIANA U-BLOOMINGTN	Graves, R.	HQ-RF	Pinelli, T. E.	NAGW 1682	3183
79	SO CAL INST OF ARCH	Cohen, M. M.	ARC	Nixon, D. A.	NCC 2-356	1688
79	STATE U NY-BINGHAMTN	Owens, F.	HQ-XE	Pattee, H.	NGT 00-050-036	4679
79	WORCESTER POLY INST	Friedman, R.	LERC	Custer, R. L.	NAG 3-821	3951
79	WORCESTER POLY INST	Snoddy, W. C.	MSFC	Tuler, F. R.	NAG 8-709	3954
99	ALABAMA A&M UNIV	Freeman, Y. B.	HQ-U	George, M. C.	NAGW 1459	1017
99	AUBURN UNIV-AUBURN	Owens, F. C.	HQ-XE	Tatarchuk, B. J.	NGT 00-050-353	1049
99	CALIF INST OF TECH	Dabbs, J.	MSFC	Prince, T. A.	NAG 8-669	1519
99	CALIF INST OF TECH	Owens, F. C.	HQ-XE	Yung, Y.	NGT 00-050-227	1576
99	CASE WESTERN RESERVE	Levine, S. R.	LERC	Farrell, D. E.	NCC 3-123	4919
99	CASE WESTERN RESERVE	Montegani, F. J.	LERC	Schuele, D. E.	NCC 3-137	4925
99	CASE WESTERN RESERVE	Oran, W. A.	HQ-IC	Wallace, J. F.	NAGW 1193	4895
99	CITY COLLEGE OF N Y	Owens, F. C.	HQ-XE	Pierson, W. J.	NGT 00-070-084	4438
99	COLUMBIA UNIVERSITY	Varcas, J.	MSFC	Halpern, J.	NAG 8-782	4479
99	FLORIDA A&M UNIV	Spears, J. M.	KSC	Kidd, C.	NAG10-44	2713
99	FLORIDA A&M UNIV	Knott, W.	KSC	Pancholy, S. K.	NAG10-51	2714
99	FLORIDA INST OF TECH	Littlefield, M.	KSC	Dilpare, A. L.	NAG10-37	2728
99	FLORIDA INST OF TECH	Brook, O.	KSC	Anger, F. D.	NAS10-11595	2730
99	HOWARD UNIVERSITY	Menchan, D.	GSFC	Woodard, M. C.	NCA 5-107	2701
99	HOWARD UNIVERSITY	McGee, A. S.	HQ-XE	Fan, D. N.	NGT 09-011-060	2705
99	HUMBOLDT STATE UNIV	Ruzek, M.	HQ-EE	Burke, R.	NGT 00-050-508	1624
99	JOHNS HOPKINS UNIV	Graeber, R. C.	ARC	Baker, S. P.	NCC 2-555	3487
99	JOHNS HOPKINS UNIV	Pilford, S. G.	HQ-EE	Edelson, B. I.	NASW 4375	3484
99	MASS INST OF TECH	Hess, C. W.	JSC	Salisbury, J. K.	NAG 9-319	3792
99	MASS INST OF TECH	Owens, F. C.	HQ-LE	Prinn, R. G.	NGT 22-009-903	3878
99	MORGAN STATE UNIV	Friedmen, D. S.	GSFC	Taylor, J.	NCA 5-104	3495
99	NEW MEX ST U-LAS CR	Dapice, R. R.	HQ-TC	Carden, F.	NAGW 1746	4394
99	NO CAR A&T STATE U	Massenberg, S. E.	LARC	Ram, B.	NAG 1-956	4776
99	OHIO STATE UNIV	Fogleman, S. W.	HQ-EB	Kraus, J. D.	NAGW 750	5043
99	OKLAHOMA STATE UNIV	Bilbrough, L.	HQ-XE	Wiggins, K.	NCCW 5	5180
99	OKLAHOMA STATE UNIV	Bilbrough, L. B.	HQ-LF	Wiggins, K. E.	NASW 4000	5179
99	OLD DOMINION UNIV	Owens, F. C.	HQ-XE	Freeman, F.	NGT 00-070-060	6089
99	PENN STATE U-UNIV PK	Smith, I. S.	GSFC	Harrison, I. R.	NAG 5-643	5310

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99	PENN STATE U-UNIV PK	Smith, I. S.	GSFC	Hunt, J. P.	NAG 5-644	5311
99	PENN STATE U-UNIV PK	Oran, W. A.	HQ-IC	Hymmer, W.	NAGW 1196	5331
99	PENN STATE U-UNIV PK	Owens, F. C.	HQ-XE	Heid, K.	NGT 00-050-393	5364
99	PENN STATE U-UNIV PK	Owens, F. C.	HQ-XE	Anderson, R. B.	NGT 00-070-044	5369
99	PRINCETON UNIVERSITY	Asrar, G.	HQ-EE	Wood, E. F.	NAGW 1392	4344
99	PURDUE UNIVERSITY	Hartmann, M. J.	LERC	Murthy, S. N.	NAG 3-1057	3213
99	SAN FRAN STATE UNIV	Milov, L. A.	ARC	Heidtmann, R. W.	NCA 2-175	1634
99	SAN FRAN STATE UNIV	Milov, L. A.	ARC	Cunningham, A. F.	NCA 2-188	1635
99	SAN FRAN STATE UNIV	Milov, L. A.	ARC	Greenaway, L. B.	NCA 2-267	1637
99	SAN FRAN STATE UNIV	Milov, L.	ARC	Greenaway, L.	NCA 2-364	1638
99	SAN JOSE STATE UNIV	Pike, R. L.	ARC	Freeman, J.	NCA 2-295	1653
99	SAN JOSE STATE UNIV	Milov, L. A.	ARC	Garrison, S. E.	NCA 2-388	1657
99	SO UNIV & A&M COL-BR	Kahn, A. B.	HQ	Roquemoire, L.	NASW 4231	3418
99	STANFORD UNIVERSITY	Givens, J. J.	ARC	Germane, G.	NCA 2-269	1771
99	STANFORD UNIVERSITY	Dyal, P.	ARC	Petrosian, V.	NCC 2-322	1807
99	STANFORD UNIVERSITY	Witherow, W. J.	MSFC	Homsy, G. M.	NAG 8-715	1720
99	STANFORD UNIVERSITY	Owens, F. C.	HQ-XE	Vitousek, P.	NGT 00-050-171	1843
99	TEXAS A&M UNIV SYSTM	Li, L. C.	JSC	Driels, M.	NAG 9-326	5623
99	UNIV ALA-HUNTSVILLE	Smith, L. J.	MSFC	Workman, G.	NAS 8-36955	1165
99	UNIV ALA-HUNTSVILLE	Mellott, M. M.	HQ-ES	Singh, N.	NAGW 1562	1148
99	UNIV ALA-UNIVERSITY	Six, F.	MSFC	Freeman, M.	NAG 8-123	1196
99	UNIV OF ARIZONA	Melugin, R. K.	ARC	Richard, R. M.	NCC 2-426	1434
99	UNIV OF ARIZONA	Tuyahov, A. J.	HQ-EE	Slater, P.	NAGW 896	1363
99	UNIV OF ARIZONA	Owens, F. C.	HQ-LE	Lebofsky, L. A.	NGT 00-050-048	1444
99	UNIV CALIF-BERKELEY	Jones, H. W.	ARC	Shu, F.	NCC 2-36	1960
99	UNIV CALIF-BERKELEY	Ellis, S. R.	ARC	Stark, L.	NCC 2-86	1961
99	UNIV CALIF-SAN DIEGO	Clayton, G.	HQ-EZ	Burbidge, G. R.	NAGW 1737	2227
99	UNIV CALIF-SAN DIEGO	Solloway, C. B.	HQ-ST	Arnold, J. R.	NAGW 629	2207
99	UNIV CALIF-S BARBARA	Imhoff, M. L.	GSFC	Simonett, D. S.	NAG 5-1010	2289
99	UNIV CALIF-S BARBARA	Tuyahov, A. J.	HQ-EE	Estes, J. E.	NAGW 1743	2300
99	UNIV OF CENTRAL FLA	Belton, C.	KSC	Gonzales, A.	NAG10-42	2759
99	UNIV OF CENTRAL FLA	David, T. C.	KSC	Gonzalez, A. J.	NAG10-43	2760
99	UNIV OF CENTRAL FLA	Davis, T.	KSC	Rice, S. L.	NAG10-58	2761
99	UNIV OF CENTRAL FLA	Boggs, W.	KSC	Khaltar, M. K.	NAS10-11351	2762
99	UNIV OF CENTRAL FLA	O'malley, J. K.	KSC	Khattar, M.	NAS10-11385	2763
99	UNIV OF CHICAGO	Alexander, J. K.	HQ-E	Meyer, P.	NGL 14-001-258	3070
99	UNIV OF CHILE	Bodin, W. J.	GSFC	Diaz, E.	NAS 5-1925	6491
99	UNIV COLORADO-BOLDR	Johnson, C. C.	ARC	Luttges, M. W.	NCA 2-452	2535
99	UNIV COLORADO-BOLDR	Kierier, J. W.	HQ-EC	Byerly, R.	NAGW 1105	2482
99	UNIV OF FLORIDA	Williams, P.	KSC	Koopman, B.	NAG10-48	2788
99	UNIV OF FLORIDA	Davis, L.	KSC	Farber, E. A.	NAS10-11481	2793
99	UNIV OF FLORIDA	Kahn, A. B.	HQ	Thornton, J. R.	NASW 4183	2792
99	UNIV OF GEORGIA	Ault, L.	HQ	Carmon, J. L.	NASW 4194	2922
99	UNIV HOUSTON-HOUSTON	Santy, P. A.	JSC	Bell, L.	NAS 9-16593	5739
99	UNIV HOUSTON-HOUSTON	Heselmeyer, R.	JSC	Hunsucker, J. L.	NAS 9-17315	5740
99	UNIV OF KENTUCKY	Bivins, R.	HQ	Strong, W. R.	NASW 4186	3389
99	UNIV OF MAINE-ORONO	Averner, M.	HQ-EB	Margulis, L.	NAGW 607	3437
99	UNIV MICH-ANN ARBOR	Singer, J.	LERC	Schwank, J.	NAG 3-951	3996
99	UNIV MICH-ANN ARBOR	Owens, F. C.	HQ-LE	Irani, K. B.	NGT 00-050-110	4077
99	UNIV OF NEW MEXICO	Bivins, R.	HQ	Morain, S. A.	NASW 4191	4423
99	UNIV OF PENNSYLVANIA	Bryan, C. J.	KSC	MacDiarmid, A. G.	NAG10-25	5389
99	UNIV OF SOUTHERN CAL	Bivins, R.	HQ	King, R.	NASW 4199	2364
99	UNIV TENNESSEE-KNOXV	Abbott, K. H.	ARC	Ali, M.	NAG 1-513	5503
99	UNIV TENNESSEE-KNOXV	Belton, C.	KSC	Chang, H.	NAG10-46	5520
99	UNIV TENNESSEE-KNOXV	Owens, F. C.	HQ-LE	Ali, M.	NGT 43-001-807	5527
99	UNIV OF VIRGINIA	Owens, F. C.	HQ-XE	Gangloff, R. P.	NGT 00-070-063	6151
99	UNIV WISC-MADISON	Twarowski, R. J.	ARC	Sromovsky, L. A.	NAS 2-12078	6429
99	UNIV WISC-MADISON	Owens, F. C.	HQ-XE	Vailas, A.	NGT 00-070-093	6453
99	COLLEGE OF WM & MARY	Holt, H. M.	LARC	Ring, L. J.	NAG 1-1002	5978
99	COLLEGE OF WM & MARY	Prior, E. J.	LARC	Kranbuehl, D. E.	NAS 1-18347	5982

NASA'S UNIVERSITY PROGRAM

APPENDIX - CROSS INDEX BY FIELD OF SCIENCE AND ENGINEERING

FIELD CODE	INSTITUTION	TECHNICAL OFFICER	TECH OFF LOC	FIRST PRINCIPAL INVESTIGATOR	AGREEMENT NUMBER	ACC NO.
99	VIRGINIA POLY INST	Nabors, S. A.	MSFC	Sink, D. S.	NAG 8-99	6217
99	VIRGINIA POLY INST	Nabors, S. A.	MSFC	Sink, D. S.	NAG 8-120	6218
99	VIRGINIA POLY INST	Owens, F. C.	HQ-XE	Dugger, W. E.	NGT 00-050-230	6235
99	VIRGINIA POLY INST	Owens, F. C.	HQ-XE	Dugger, W. E.	NGT 00-050-396	6237
99	VIRGINIA STATE UNIV	Owens, F. C.	HQ-LE	Wightman, J. P.	NGT 00-050-112	6248
99	WAKE FOREST UNIV	Belton, C.	KSC	Thomas, S. J.	NAG10-45	4837
99	WASHINGTON UNIVERSTY	Davis, R. M.	KSC	Morley, R. E.	NAG10-34	4208
99	WASHINGTON UNIVERSTY	Alexander, J. K.	HQ-E	Walker, R. M.	NAGW 122	4198
99	WASHINGTON UNIVERSTY	Owens, F. C.	HQ-XE	Arvidson, R. E.	NGT 00-050-162	4217
99	YALE UNIVERSITY	Lee, C. M.	LERC	Pfetterle, L. D.	NAG 3-996	2598
99	YALE UNIVERSITY	Owens, F. C.	HQ-XE	Reifsnyder, W. E.	NGT 00-050-266	2609

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